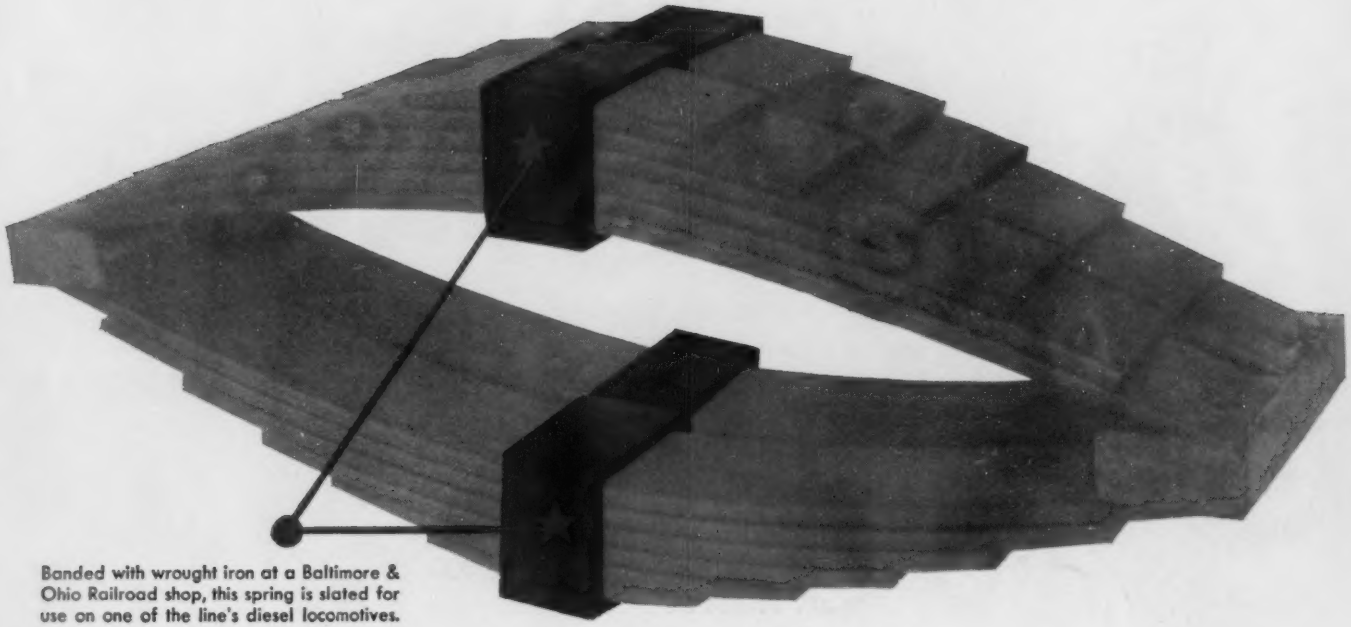
October 22, 1956

How Incentives Create Salesmen . . . p. 32

RAILWAY AGE

THE INDUSTRY'S WEEKLY NEWSMAGAZINE



Banded with wrought iron at a Baltimore & Ohio Railroad shop, this spring is slated for use on one of the line's diesel locomotives.

Wrought Iron spring bands resist compression and snap-back

Wrought iron performs one of the most punishing tasks you can ask of a metal for a railroad application . . . holding the leaves of elliptical springs in a group.

Spring compression and snap-back cause impact stresses which would take a terrific toll on ordinary metals. But not on wrought iron. The tough hickory-like structure of this material puts the handcuffs on such punishment . . . assures longer life.

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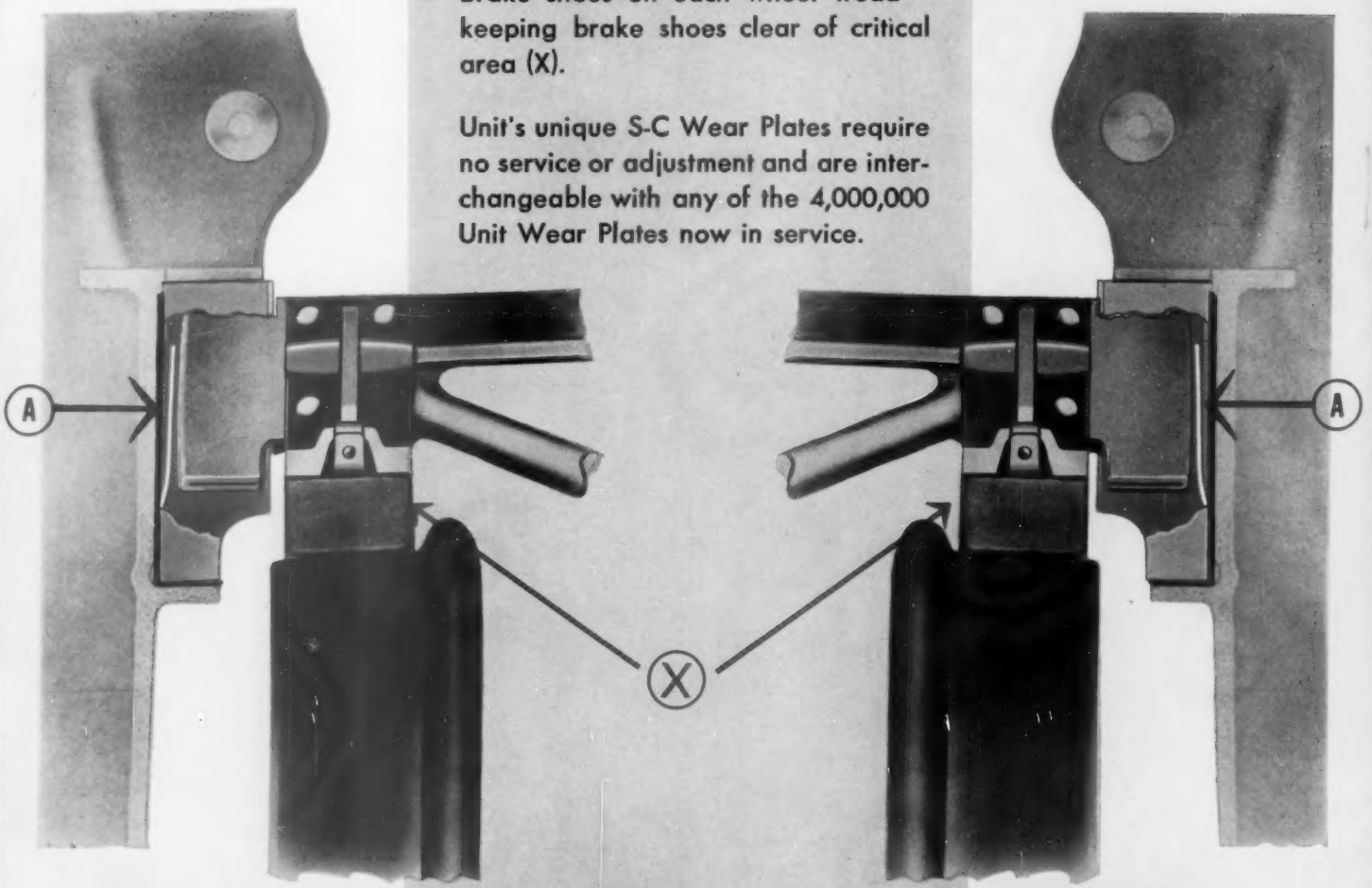
S-C FOR FINER UNIT PERFORMANCE

IN THIS CRITICAL AREA

When lateral movement of a brake beam brings either brake shoe into this critical area *it is riding the wheel flange*—one of the major causes of flange and brake shoe wear.

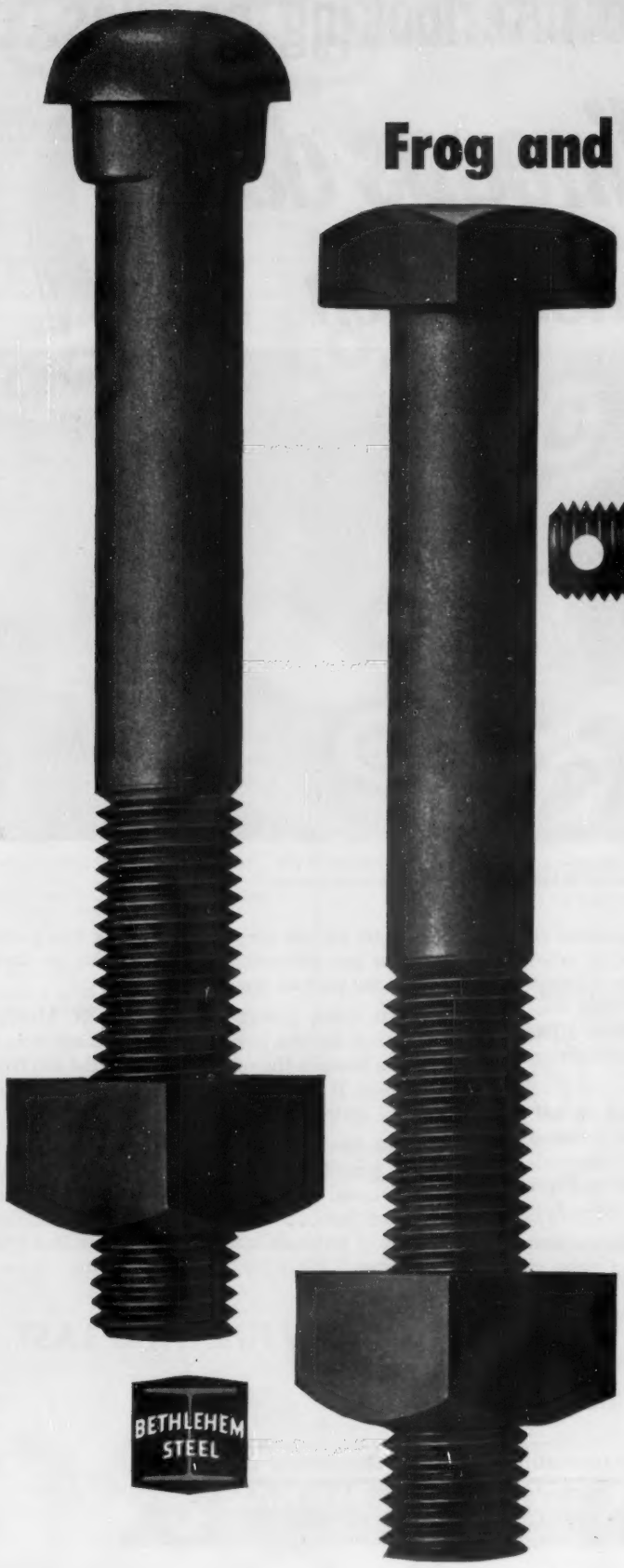
In a Unit Truck equipped with S-C Wear Plates, rugged built-in springs (A) automatically set up the compensating force needed to re-position the brake shoes on each wheel tread—keeping brake shoes clear of critical area (X).

Unit's unique S-C Wear Plates require no service or adjustment and are interchangeable with any of the 4,000,000 Unit Wear Plates now in service.

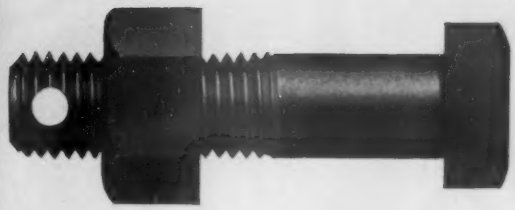


UNIT TRUCK CORPORATION **NEW YORK**

Frog and Switch Bolts



MADE IN FULL SIZE RANGE



Whatever your requirements for frog bolts or switch bolts, you can count on getting the style and size you want when you choose Bethlehem.

Bethlehem Frog and Switch Bolts are made of carbon steel in all standard types and sizes, and can be supplied with any type of standard nut. They are heat-treated to meet the requirements of AREA 1953 Spec., or ASTM Spec. A183-55, and can be counted on for a good holding job. Write to us for complete information.

OTHER BETHLEHEM FASTENERS FOR RAILWAYS

TRACK BOLTS	ROCK ANCHOR BOLTS
SPIKES	BRAKE PINS
MACHINE BOLTS	CARRIAGE BOLTS
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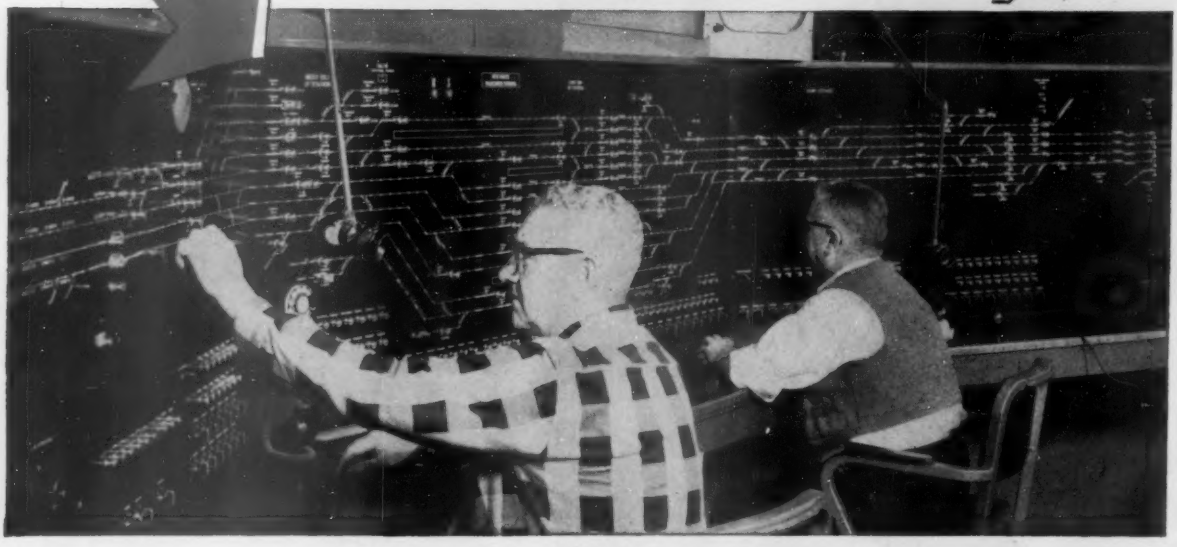
BETHLEHEM STEEL

UNION Route Interlocking handles

1750 lineups daily at New Haven



UNION Route Interlocking multiplies manpower—makes it possible for an operator to handle extremely large and busy areas.

The New Haven Railroad is consolidating control of nine new electric interlocking layouts, within 10 miles of New Haven, at one new UNION Route Control machine. A conservative count for the first four consolidated interlockings in service showed about 1,750 lineups daily—all controlled from the one push-button machine.

LARGEST PROJECT. This is the largest and busiest consolidation of remote-controlled interlockings ever handled by one push-button machine. Traffic is heavy—amounting to more than "a-move-a-minute"—and will get heavier as the consolidation continues.

EASE OF OPERATION. The UR interlocking system makes it possible to line up the best route through a maze of switches and signals simply by pressing two buttons. The routes are self-restoring and require no further action on the part of the operator.

HIGH-SPEED CODE CONTROL. The UNION Multiplex Code Control System is used to transmit controls and indications between the control machine and the remote interlockings. It is the fastest all-relay coded interlocking control system yet developed.

OPERATING ADVANTAGES. These modern UNION systems are providing simplified operation and reduced operating costs. In-service performance has proved to the railroad that . . . "there is virtually no limitation of the extent of territory which can be controlled from a single station." Write for the complete story.

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DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY

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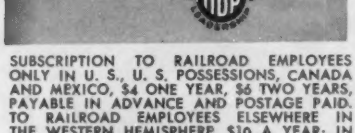

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Workbook of the Railways

Vol. 141, No. 18
October 22, 1956

CONTENTS and

Week at a Glance

Effective defense transportation . . .

. . . can be most surely provided if peacetime regulations of the industry are greatly relaxed, UCLA Transportation Professor Harold Koontz told the NDTA at Salt Lake City last week. He set forth a three-point program to achieve "free responsible competition." . . . p.7

Handicaps to electrification . . .

. . . will be eliminated if the progress in locomotive and motor design brought on with the diesel locomotive is combined with advances in vacuum tube current conversion and power transmission, J. W. Barriger told the Railway Systems & Procedures Association at Chicago. . . . p.8

FORUM: Time to think . . .

. . . possibly is the biggest thing lacking in the railroad executive's budget. Fact is, it's so rare that a man who makes room for a bit of skull exercise is likely to be suspected of loafing or day-dreaming. Most of the men who should be thinking are too busy with chores to do it. First step for more net: more thinkers. . . . p.21

Controversy on freight car bearings . . .

. . . continues as the Technical Advisory Committee of Solid Journal Bearing Manufacturers releases a study of bearing economics differing sharply as to figures and interpretations from the roller bearing proponents' views. . . . p.22

Maximum use of single track . . .

. . . is the Seaboard's way of giving service in a growing territory. This is accomplished by traffic control covering all single main lines (i.e., most of the railroad), minimizing operation by timetable and train orders. . . . p.27

Pile drivers for any job . . .

. . . have the versatility and capacity required on the Santa Fe. . . . p.30

Incentives produce salesmen . . .

. . . instead of ticket sellers—to the profit of the employee

AIR COSTS MONEY!

Stop leakage with new WABCOSEAL® Angle Cocks

BRAKE pipe leakage increases compressor operation, lowers its efficiency and causes difficult train handling. Reduce leakage to the minimum by installing the *new* Wabcoseal Angle Cock shown here. Two styles are available—with or without spring-locking handle.

Heart of the new Wabcoseal Angle Cocks is the sealed key that stays tight through a wide degree of key wear. A Wabco compression ring replaces the standard tapped thread at the brake pipe end to give a positive seal. Also, adequate end tolerance is provided so brake pipe nipple need not be cut to precise length.

The passenger car and locomotive angle cock has a spring loaded handle that snaps the socket into locked position when handle is fully open or closed and keeps it there despite vibration and shock.

The sealed key and spring locking handle are available separately for application to present angle cocks.

FOR FREIGHT CARS:
Wabco compression ring grips pipe when nut is tightened to provide tight seal and strong clamping action.
Brake pipe nipple length can fall anywhere within this range and still be perfectly sealed. Threaded nipple is not necessary but can be used if more convenient.
"O" ring seals the key effectively through a wide degree of key wear. This seal can be obtained on old angle cocks by properly reaming the bushing and inserting new key.

FOR PASSENGER CARS AND LOCOMOTIVES:
New Wabcoseal fitting is same as for freight car angle cock shown at left.
Shouldered Pin
Strong spring is compressed when handle is raised. Socket is snapped into locking position when handle is fully opened or closed. Available for application to angle cocks now in use. A shouldered pin provides proper freedom of handle movement.
Sealed key is identical to freight car angle cock key shown at left.

Westinghouse Air Brake COMPANY

AIR BRAKE DIVISION WILMERDING, PA.

GEARED TO PROGRESS
PRI MEMBER

Current Statistics

Operating revenues, eight months	
1956	$6,954,232,982
1955	6,590,067,867
Operating expenses, eight months	
1956	$5,374,619,154
1955	4,968,039,671
Taxes eight months	
1956	$731,401,365
1955	719,134,174
Net railway operating income, eight months	
1956	$675,628,799
1955	732,614,139
Net income, estimated, eight months	
1956	$530,000,000
1955	579,000,000
Average price 20 railroad stocks	
October 16, 1956	98.23
October 18, 1955	90.74
Carloadings revenue freight	
Forty weeks, 1956	28,992,895
Forty weeks, 1955	28,728,931
Average daily freight car surplus	
Wk. ended Oct. 13, 1956	4,320
Wk. ended Oct. 15, 1955	3,202
Average daily freight car shortage	
Wk. ended Oct. 13, 1956	16,762
Wk. ended Oct. 15, 1955	21,561
Freight cars on order	
October 1, 1956	122,421
October 1, 1955	52,913
Freight cars delivered	
Nine months, 1956	47,897
Nine months, 1955	25,901
Average number railroad employees	
Mid-September 1956	1,041,404
Mid-September 1955	1,092,367

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Week at a Glance CONTINUED

and the employer. A Pullman Company test of this idea produced significant returns. . . . p.32

"Cocoon" car cuts costs . . .

. . . for shippers of coil steel, and its builders believe it will enable railroads to win back such traffic that may be moving off-rail. . . . p.36

B R I E F S

Supporting the Ex Parte 206 rate-hike plea . . .

. . . are 22 verified statements filed with the ICC by eastern and western railroads which are petitioners in this "15 per cent case." The statements, including 10 from railroad presidents, present detailed information and figures justifying averments of the carrier petition, especially its warning that the petitioners' rates of return must be increased if they are to prevent further "deterioration" in their credit standing (Railway Age, Oct. 8, p. 7).

"Negotiations are continuing" . . .

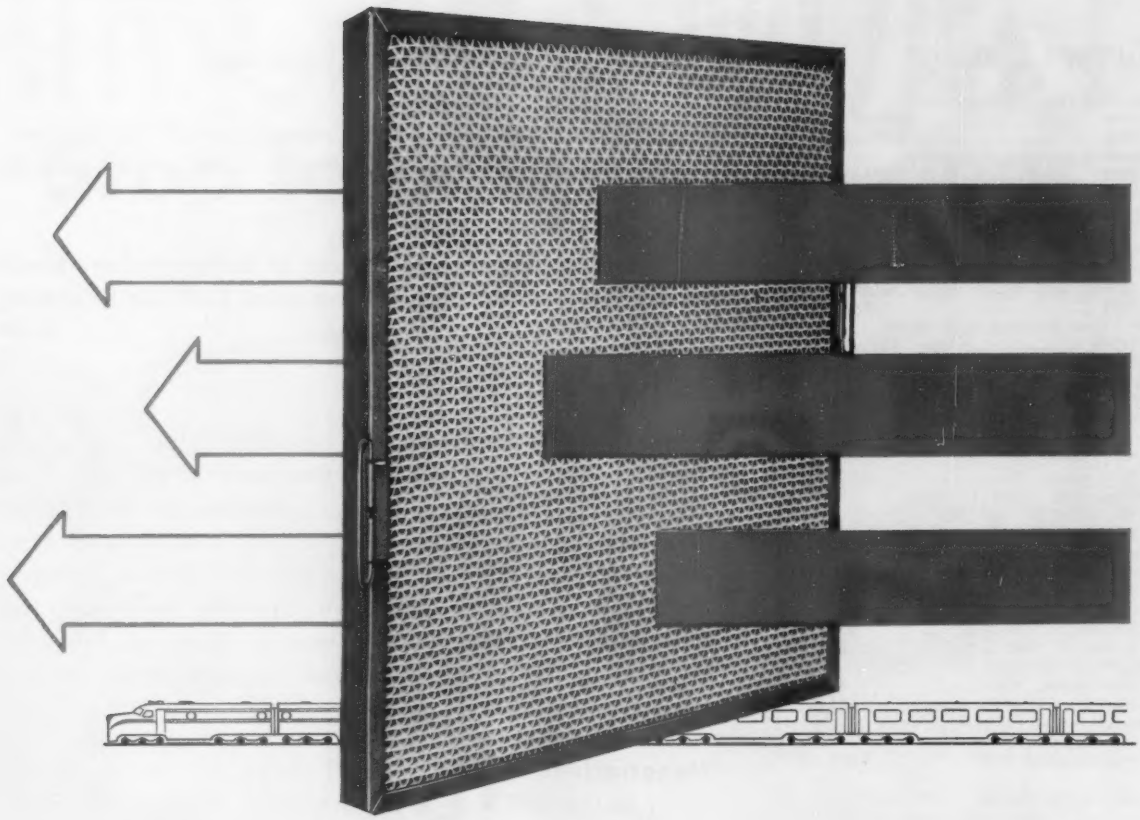
. . . in the C&NW severance-pay case, "but not much progress is being made," according to W. G. Rupp, federal mediator. Eleven unions, headed by the Railway Clerks, are seeking dismissal pay equal to total previous compensation. The unions already have voted to strike (Railway Age, Sept. 24, p. 11).

Freeze of present demurrage rates . . .

. . . will remain in effect while the ICC investigates the railroads' proposal to increase them. The entire commission voted last week not to vacate Division 2's August 28 order which suspended the increase from September 1 until March 1, 1957. Lifting of the suspension was sought in a railroad petition (Railway Age, Oct. 1, p. 13), which was opposed by numerous shipper interests, including the National Industrial Traffic League.

New Haven sets "Dan'l Webster" run . . .

. . . for October 28 or as soon thereafter as possible. Pullman-Standard equipment with Baldwin-Lima-Hamilton engines front and rear is to be put into experimental New York-Boston service to see if the three-hour schedule envisioned is feasible. Minimum fanfare will mark debut of the "Dan'l Webster," first of three lightweight trains on order for the NH.



Cut maintenance, increase engine life with Esso AIRFIL® Coating Oil

Esso's new AIRFIL Coating Oil for diesel engine air filters has such great dirt pick-up qualities that it can substantially cut maintenance costs and increase engine life. This is possible because of the reduction in abrasive wear, lessening the need for replacements of engine parts. You, too, can profit from these benefits by using Esso AIRFIL Coating Oil in diesel air intake filters, and in air-conditioning filters.

Esso AIRFIL COATING OIL offers three important advantages:

1. Easy to apply...won't drip off. In liquid form when hot, it may be applied quickly in the desired quantity, while at normal temperatures, it is a gel-like solid that won't run off.

2. Superior wicking qualities mean a continually fresh surface is presented to the air. Successive layers of dust are rapidly wetted, keeping dirt-retaining efficiency at a maximum.

3. Insoluble in water . . . won't emulsify, and so resists removal by rain or snow, yet it can be removed quickly by hot detergent wash or steam blast.

Esso

RAILROAD PRODUCTS

Esso offers a complete line of dependable railroad products. Valuable years of experience in research and development, combined with continual testing on the road and in the lab, stand back of the outstanding performance of Esso Railroad products.

For data sheet regarding specifications of AIRFIL Coating Oil, write to Esso Standard Oil Company, Railroad Sales Division, 15 West 51st Street, New York 19, N. Y.

Can RRs Meet Defense Needs?

NDTA hears plea for greater competitive freedom in transportation, more effective management, and less reliance on legalistic procedures

"Free responsible competition" is the key to an economically sound transportation system, Harold Koontz, professor of business policy and transportation, University of California, Los Angeles, said last week in Salt Lake City, Utah, at the 11th annual meeting of the National Defense Transportation Association.

Mr. Koontz expressed concern about the ability of the transportation system to meet the needs of defense. "I have long noted, particularly in the regulated common carriers, an understandable preoccupation with regulation rather than with management and growth."

Too Much Law—"There is a tendency to overestimate and rely too much upon legalistic processes," he said. "I sometimes wonder whether the regulated common carrier managers and personnel do not become so engrossed in the job of meeting regulations that they forget why the company is in business."

"Regulation is, by its very nature, not progressive, but tends to look backward and protect the status quo," Mr. Koontz continued. "Much of our transportation regulation is designed to protect against competition, to shelter vested interests, and to remove marginal responsibility for economic success from the managers to the regulators."

Mr. Koontz, criticizing the Weeks Report, said it "is narrow, omits any reference to public aids and their effect on competition, and sets one mode of transportation against another. It does little to make competition between all carriers, regulated or unregulated, effective," he added.

Outmoded Ideas—"Our present transportation policy and opposition to its change appears to be based upon certain assumptions, most of which do not square with the facts of 1956," Mr. Koontz said. Present regulation is not protecting the regulated common carrier from the competitive inroads of partisan regulation, exempt common carriers, and private transportation, he continued. For example, "only 57% of domestic freight traffic is subject to reasonably thorough economic regulation and nearly 9/10ths of this traffic is handled by railroads."

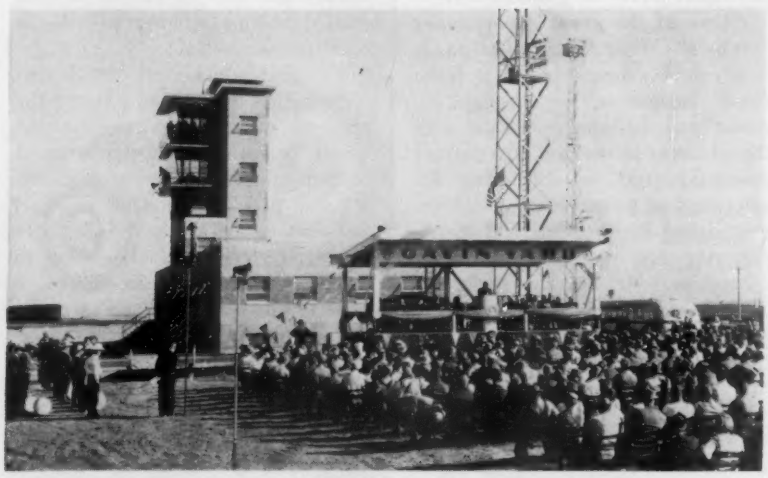
There is no parallel to transportation regulation in any other defense industry, Mr. Koontz declared. "I shudder to think where our defense effort might be today if we applied common carrier type controls to the aircraft, missile, electronic, tank, and component and accessory industries. I doubt that there would be the advance of design and potential for defense production."

The best assurance we have of meeting our defense needs is a transportation industry managed with as much freedom as possible, he said. "This means a healthy, hard-hitting, and responsible industry, sensitive to the profit making potential of our growing economic system."

Competition's Program — Mr. Koontz recommends a program for establishing a policy of "free responsible competition" in transportation, embodying these points:

(1) Some effective legal provisions against price and service discrimination which injures competition between carriers and between customers and carriers. He emphasized that this protection should preserve competition and not competitors. "There is no guarantee of survival to the inefficient or ineffective, or unlucky."

(2) Effective legal provision for the qualification of entrance into the transportation business. An application to enter the transportation industry should be judged on whether the applicant is "fit, willing, and



GN Dedicates New Automatic Yard at Minot

New classification yard at Minot, N.D., dedicated on October 12 (above), sets stage for stepped-up freight service on the Great Northern. More than a year in construction, Gavin yard cost the railroad close to $6.5 million. It is strategically located near the junction of GN's principal East-West lines from the Twin Cities and Duluth-Superior, and, with two hump engines, will handle classification of up to 150 cars an hour.

able." There should be no requirement that the newcomer's entry protect existing carriers, he said.

(3) Special government aid might be given to those common carriers that perform vital public service where service could not be performed efficiently and effectively under a system of competition.

Other speakers at the four-day NDTA meeting were Commissioner Owen Clarke, Interstate Commerce Commission; William T. Faricy, president, Association of American Railroads; Col. Robert S. Henry, vice-president, AAR; E. G. Plowman, vice-president, traffic, U. S. Steel, and chairman of the NDTA board; James K. Knudson, former member of the ICC; C. C. Thompson, American Waterway Operations, Inc.; John B. Hulse, managing director, Truck-Trailer Manufacturers Association; and Giles Morrow, president, Freight Forwarders Institute.

Commissioner Clarke outlined the government's role in mobilization planning and preparedness. He said, "being realistic we might as well recognize that there would not be sufficient equipment and transport service to go around" if we are called upon to protect ourselves in an emergency.

Government's wartime role is one of "keeping the national transportation system operating effectively and in the service of all parties to the national defense effort," Commissioner Clarke said. "We see it as a job of coordinating rather than one of commanding transport service."

The difference between our needs and our available freight service "would have to be made up in the ingenuity and skill with which the limited facilities were put to use," he told the convention.

Roll - with - the - Punch — The built-in resiliency of rail transportation was cited by Mr. Faricy as one of the "inherent characteristics" which are valuable to national defense. He pointed to the railroads' great economy in use of scarce resources, high capacity and ready expansibility in emergency, resistance to attack and rapid powers of recuperation, and ability to localize the effects of interruption to service.

Railroad resistance to an atomic bombing is indicated by the fact that regular rail service was resumed in Hiroshima within 18 hours after the first atomic bomb was dropped on that city, he told the meeting.

Electrification Gets a Boost at RSPA

Barriger sees new form of motive power emerging as roads capitalize on what they've learned from diesels

Extensive electrification, stemming from the knowledge and experience gained with diesel-electric power, may well be the mark of railroad progress in the decade of the 60's.

John W. Barriger, president of the Pittsburgh & Lake Erie, made this suggestion at the fall meeting of the Railway Systems & Procedures Association in Chicago. Mr. Barriger warned railroad officers to avoid any "sentimental attachment" to present-day diesel power as a final answer.

"One of the great opportunities that lie ahead for American railroads is to combine the progress which the diesel locomotive has brought to motor and locomotive design with the advances in vacuum tube current conversion and the concurrent development of power transmission accomplished by the electrical manufacturing and public utility power companies," Mr. Barriger declared.

These developments, he said, will eliminate the handicaps that have obstructed electrification in the past and will provide opportunity for widespread use of this type of train operation. This, in turn, will permit operation of heavier trains at higher speeds, he added.

"A great collateral advantage of railway electrification will be the return to coal as the principal source of energy for rail operation," Mr. Barriger continued. He pointed out that this would help conserve petroleum resources and provide traffic benefits by reconciling locomotive fuel requirements with the revenue base of many of the larger railroads.

The importance of the diesel for the present and immediate future cannot be overemphasized, Mr. Barriger said. But, he added, the diesel-engine-driven generator will be no match for the stationary steam-turbine-driven power plant if a low-cost power transmission system can be developed and some of the present technical problems relating to railway electrification solved.

The P&LE president noted that dieselization has carried forward the progress of direct current traction motor design to high standards of performance, and electrical engineering has provided ignitron tubes of sufficient capacity and endurance to permit conversion of alternating to direct current on the locomotive.

"Transmission of power through the catenary system at commercial generating station standards of 110,000 volts pressure and 60 cycle alternations will permit use of relatively light construction in pole lines and wire systems and the avoidance of substations," he added.

Mr. Barriger's look to the future was not limited solely to power.

He suggested, for one thing, that electricity should become the sole means of controlling train braking

(Continued on page 10)

Honor for CPR's Crump

Norris R. Crump (right), president of the Canadian Pacific, accepting the Edwin O. Seits Memorial Award as the National Management Association's "International Management Man of the Year." Presentation, at the association's recent annual convention in St. Louis, was made by the group's president, Gordon R. Parkinson. Mr. Crump received the award "for manifold contributions to free enterprise and the management profession."

RAILWAY MARKET OUTLOOK THIS WEEK

a RAILWAY AGE Workbook Page

Carloadings Up.—Loadings of revenue freight in the week ended October 13 totaled 823,207 cars, the Association of American Railroads announced on October 18. This was an increase of 8,203 cars, or 1.0%, compared with the previous week; an increase of 1,629 cars, or 0.2%, compared with the corresponding week last year; and an increase of 101,871 cars, or 14.1%, compared with the equivalent 1954 week.

Loadings of revenue freight for the week ended October 6 totaled 815,004 cars; the summary, compiled by the Car Service Division, AAR, follows:

REVENUE FREIGHT CAR LOADINGS
For the week ended Saturday, October 6

District	1956	1955	1954
Eastern	127,128	127,283	107,866
Allegheny	152,863	153,052	120,731
Pocahontas	67,356	63,048	51,088
Southern	131,518	131,202	124,265
Northwestern	140,950	140,197	112,807
Central Western	134,721	127,780	129,596
Southwestern	60,468	58,995	56,557
Total Western Districts	336,139	326,972	298,960
Total All Roads	815,004	801,559	702,910
Commodities:			
Grain and grain products	57,898	54,904	48,102
Livestock	14,626	13,746	14,989
Coal	144,370	137,704	125,003
Coke	12,505	12,943	7,826
Forest Products	44,655	44,813	45,327
Ore	87,220	81,543	48,606
Merchandise l.c.l.	62,619	65,303	65,238
Miscellaneous	391,111	380,583	347,819
October 6	815,004	801,559	702,910
September 29	831,438	815,535	721,643
September 22	822,255	813,720	710,215
September 15	820,666	817,234	711,228
September 8	679,611	701,992	601,525
Cumulative total, 40 weeks	28,992,895	28,728,931	25,978,030

In Canada.—Carloadings for the nine-day period ended September 30 totaled 105,292 cars, compared with 96,305 cars for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
September 30, 1956	105,292	39,674
September 30, 1955	122,057	42,165
Cumulative Totals:		
September 30, 1956	3,308,939	1,300,850
September 30, 1955	3,011,903	1,214,193

New Equipment

LOCOMOTIVES

► *Diesel Prices Going Up.*—Electro-Motive last week announced a price boost on its complete line of diesel-electric locomotive units; price increase, to become effective December 1, will range from 4½% to 5%; Fairbanks-Morse reported similar plans for a price hike of "approximately 5%"; Alco Products had "no comment" in response to a query about its plans.

FREIGHT-TRAIN CARS

► *September Orders Up, Deliveries Down.*—New freight cars ordered in September totaled 3,949, compared with 2,575 in August and 3,228 in September 1955, ARCI and AAR report; new freight cars delivered in September totaled 3,444, compared with 5,364 in August and 3,118 in September 1955; October 1 backlog was 122,421, compared with 122,870 on September 1 and 52,913 on October 1, 1955.

TYPE	Ordered Sept. '56	Delivered Sept. '56	On Order Oct. 1, '56
Box—Plain	250	1,105	40,881
Box—Auto	0	0	1,900
Flat	0	210	4,671
Gondola	27	260	12,255
Hopper	2,225	795	39,472
Covered Hopper	478	56	7,211
Refrigerator	310	289	5,604
Stock	0	0	0
Tank	643	628	7,628
Caboose	16	80	2,675
TOTAL	3,949	3,444	122,421
Car Builders	3,816	1,821	60,513
Company Shops	133	1,623	61,908

New Facilities

► *Atlantic Coast Line.*—Ordered from Union Switch & Signal—Division of Westinghouse Air Brake Company equipment for installation of CTC between Jesup and Brunswick Jct. (Waycross) Ga., 38 miles; new territory will be controlled from an addition to existing machine at Waycross, controlling Walthourville to Jesup.

► *Canadian National.*—Plans to spend $1 billion in next 10 years for improvements in signalling and terminal facilities, heavier rail installations and improved road beds, according to S. W. Fairweather, vice-president, research and development.

► *Chesapeake & Ohio.*—Ordered from Union Switch & Signal—Division of Westinghouse Air Brake Company, equipment for electro-pneumatic car retarder installation in new 32-track westbound manifest yard at Russell, Ky.; a 42-cylinder master retarder and four 28-cylinder group retarders will be controlled automatically with Union automatic switching, Teletype tape storage and Velac automatic retarder control. (*Continued on next page*)

RAILWAYS IN THE MARKET—THIS WEEK

CONTINUED

► *Duluth, Missabe & Iron Range.*—Will build new diesel repair shop at Proctor, Minn.; estimated cost $1,600,000.

► *Frisco.*—Will install automatic electric air compressors, and modernize power plant, at Oklahoma City, Okla., and Fort Scott, Kan., total cost $66,000.

► *Louisville & Nashville.*—Construction has begun on new $8.5 million hump retarder yard at Boyles, Ala., 3½ miles north of Birmingham; new facility, when completed, will handle daily load of 3,500 cars, or peak load of 4,200 cars, on seven receiving, 40 classification and 10 departure tracks; it will have closed circuit television, 105-ft electronic scale to weigh cars while in motion, paging and talk-back system, pneumatic tube system for transporting waybills, locomotive servicing facilities and light car-repair facilities.

► *Milwaukee.*—Will step-up new yard facilities under construction at Othello, Wash., from five to 11 tracks, total cost $712,000.

► *New York Central.*—Ordered equipment from General Railway Signal Company for installation of 70 miles of centralized traffic control between Pana, Ill., and Lenox, and 133 miles of Syncroscan CTC between Toledo, Ohio, and Elkhart, Ind.

► *Rock Island.*—Ordered from Union Switch & Signal—Division of Westinghouse Air Brake Company equipment to extend present CTC territory, between Manly, Iowa, and Albert Lea, Minn., to Fairbault, Minn., an addition of 48 miles; order includes material for changing existing CTC control machine at Albert Lea to handle added facilities; existing mechanical interlocking at Albert Lea will be replaced by all-relay type interlocking with control on the CTC machine; installation also will include rearrangement of present APB signaling and removal or lengthening of sidings to obtain maximum advantages of CTC.

► *Southern Pacific.*—Plans to build multi-million dollar, 10-story building behind SP's general office building in San Francisco have been announced by George W. Warnecke & Co., New York; SP is arranging to lease proposed building as annex to its present headquarters; building, to house approximately 40% of road's general office staff, will take estimated 15 months to build once work begins; because eight floors of new building will house mainly SP accounting department, design provides large working areas for automatic business machines and other electronic data-processing machines; new building will have passenger heliport on roof for private SP operations; when construction is completed, SP intends to remodel the old building.

Maintenance Expenditures

► *Down 1.1% in July.*—Expenditures by Class I roads for maintenance of equipment, way and structures were $2.9 million less in July than in the same 1955 month, according to ICC Bureau of Transport Economics & Statistics report summarized below:

	July '56	July '55	% Change
Maintenance of Way & Structures	$118,113,329	$121,785,671	—3.0
Maintenance of Equipment	148,501,736	147,796,472	+0.5
Totals	$266,615,065	$269,582,143	—1.1

(Continued from page 8)

systems to provide instantaneous and precisely graduated brake applications beyond the service standards possible through use of differential air pressures.

He said the necessity for manual coupling is the "greatest single deficiency" in car design and construction and called for a device to integrate all vital attachments into the coupler so as to make the important unions automatic and tight when cars are joined together.

He said the longheld belief that railway track must combine resilience with rigidity may be wrong, and one can reflect upon the advantages which would follow "imbedding a perfect track structure in completely rigid concrete; provided, of course, the rails are kept in perfect alignment and surface." Present heavy-density, high-speed routes, he added, "probably should be converted into a track structure which carries the rail on continuous concrete beams imbedded in wide lanes of concrete."

Mr. Barriger referred to the "burdensome routine" of billing freight, coordinating handling of waybills to car movement, collecting freight charges and making interline settlements. He called this procedure "perhaps the most antiquated phase of railroad operating methods."

Ben W. Heineman, chairman of the Chicago & North Western, and Stanley Berge, transportation professor at Northwestern University, who also addressed the RSPA meeting, were both critical of specific railroad accounting practices.

Mr. Heineman said railroad costs are not now controllable in the short run, and that each road must develop its own costing setup because figures based on national averages are no good.

The big need is to find out what standards and equipment railroads need to do this job, Mr. Heineman continued. He added, for example, that at present there is no way for a railroad to figure the cost of handling the incremental freight car. He said his own road hopes to develop performance standards for yard and station operations, and pointed out that management must have current revenue and cost figures in order to make sound decisions.

Mr. Berge, whose recent studies of the passenger deficit have stirred

railroad interest, charged that ICC accounting rules, "originally developed in 1887 and not greatly changed since 1914," have created today's "fantastic phantom deficits."

In our zeal to measure the "mirage" created by this "unrealistic" formula for dividing costs between freight and passenger services "some of us have all but forgotten the real opportunities and challenges of passenger and allied services," he said.

Mr. Berge said what is really needed is a refreshing approach to pricing and merchandising of passenger and head-end business, and urged a "scheme for pricing passenger service which will reflect the best judgment of private management as applied to each individual passenger train."

UP Dining Cars Win Public Health Citation

A certificate of merit for dining car sanitation and design has been awarded to the Union Pacific by the U.S. Public Health Service. This is the second time the award has been presented to a major railroad. The Erie received a similar citation in 1953 (Railway Age, June 15, 1953. p. 12).

To win the certificate of merit, all UP dining car equipment—54 diners and 44 lounge cars—had to average higher than 95 in sanitation inspections. The award was based on high scores both in sanitation and construction of diners.

Export Coal Boom Seen Needing Big RR Investment

American railroads and coal producers face the loss of the growing European market if the facilities needed to keep pace with the demand are not provided, M. I. Dunn, vice-president, operations, Chesapeake & Ohio, said recently.

Addressing an American Management Association conference at New York on "operations research," Mr. Dunn said "it is estimated that from a level of 35 million this year, the demand will reach 50 million tons of American coal for Europe in 1958 and as much as 100 million tons in 1962 if transportation by rail and ship is available."

He said that if the C&O is to maintain its "traditional position" of handling "about half" the European export coal, it must increase its 36 million ton annual capacity at Newport News. To do this, Mr. Dunn went on, the road must buy more power and cars, build another coal pier with additional yard tracks to serve it, and increase its main line capacity by means of CTC or double-tracking some main line sections. This would involve, he said, "expenditure of many millions of dollars and 18 to 24 months construction time."

He warned, however, that if the European market develops as expected and the facilities for shipment from America are not provided, the demand could be satisfied with coal from undeveloped areas in Africa or from behind the Iron Curtain, or with Near East oil.

"Once established," Mr. Dunn stated, "these sources, being closer to Europe than we, the transportation cost advantages would be the determining factor and this market might be lost forever to America."

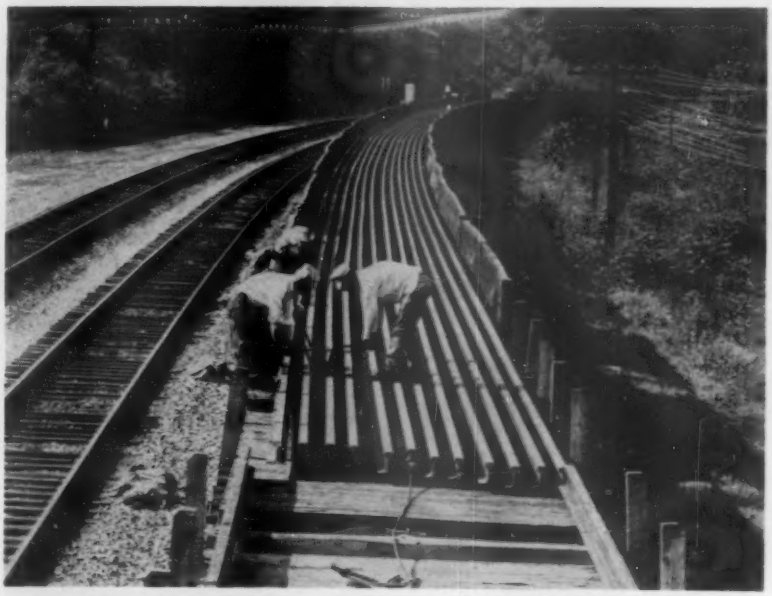
C&NW To Trim Some Passenger Runs

Too many unneeded passenger trains are siphoning off funds which could be used to improve the Chicago & North Western's freight and passenger service, Ben W. Heineman, C&NW chairman, and C. J. Fitzpatrick, president, said in a recent joint statement.

The announcement made it clear that the C&NW does not intend to "get out of the passenger business." Rather, the road plans to reorganize and streamline its present passenger service to conform with "actual current needs."

Initially the road's streamlining program calls for:

(1) A complete reappraisal of passenger train operations on the basis of current usage; (2) Readjustment and improvement of passenger service, including improved



PRR Testing Welded Rail on Its Main Line

Seven miles of welded rail are being installed by Pennsylvania in three areas of its main line track. First sections are shown being unloaded above near Johnstown, Pa., where two miles of 140-lb rail are being laid. Other installations are at Van Wert, Ohio, —two miles of 133-lb rail—on Pittsburgh-Chicago line, and near North East, Md.,—three miles of 155-lb rail—on Washington-New York line. PRR also is laying 121 miles of welded rail in Conway yard. PRR will use tests to determine whether welded rail installation and maintenance are more economical than bolted rail, and decide whether to expand its use of ribbon rail.

connections with trains of other carriers; (3) Taking immediate action to discontinue poorly patronized trains with high operating deficits. Several of these money losers are principally "head-end" trains used by relatively few passengers; and (4) Applying the savings derived to improvements in passenger and freight service.

PRR Piggyback Sets New Record

A record movement in the last several weeks of 1,000 motor common carrier trailers per week was announced October 15 by E. F. Ryan, president of the Rail-Trailer Company, which serves as intermediary in the Pennsylvania's motor common carrier TrucTrain service.

Commenting on the new peak in volume, Mr. Ryan cited the long haul rail lift as "a very significant increase in the ton-mile volume of motor carrier traffic handled in trailer-on-flatcar service."

TrucTrain service on the PRR involves joint operations with 28 motor carriers. Much of the traffic moves in solid trainloads over the full length of the PRR between New York and Chicago or St. Louis.

Mr. Ryan said the volume of this service has grown from the initial movement of 600 trailers per month to the current rate of 4,000 per month in its 20 months of operation.

He attributed this progress to the PRR's offering of "special service and price attractions shown by actual experience to be required for the successful development of this new business."

ICC Sets Up Defense Executive Unit

The Interstate Commerce Commission has established a unit of the National Defense Executive Reserve.

The commission's action, embodied in Administrative Order ICC TM-1, was authorized by a February 23, 1956, order of the director of the Office of Defense Mobilization. The ODM order authorized agencies having essential wartime functions to launch training programs for qualified persons volunteering to fill executive government posts in the event of mobilization.

The commission's announcement said that the unit will be composed of "executive personnel selected from all major segments of the transportation economy." The training program will be under the direction of the head of the commission's transport mobilization staff.

During the first year, however, the program will be on a "pilot" basis, with not more than 50 reservists undergoing training. The reservists will be limited to participation in the training program and will not act or advise on any matters pending before the commission. They will serve without compensation, but they may claim traveling expenses and a subsistence allowance not to exceed $15 per day.

Photo Courtesy Central Coast Railway Club

Nevada Northern Celebrates First 50 Years

Returned to service in recent ceremonies marking the 50th anniversary of the Nevada Northern, this 46-yr-old, Baldwin-built, 10-wheeler is shown making one of several short trips with Ely, Nev., residents who participated in celebration. Rail passenger service was terminated on road in 1941, but baggage car and coach were taken out of retirement and two Southern Pacific commuter coaches were borrowed for the day.

June Accidents

The ICC has made public its Bureau of Transport Economics and Statistics' preliminary summary of railroad accidents for June and this year's first six months. The compilation, subject to revision, follows:

Item	Month of June		6 months ended with June	
	1956	1955	1956	1955
Number of train accidents*	816	718	4,704	3,979
Number of accidents resulting in casualties	36	47	263	222
Number of casualties in train, train-service and nontrain accidents:				
Trespassers:				
Killed	101	70	369	322
Injured	103	77	407	354
Passengers on trains:				
(a) In train accidents*				
Killed	..	..	43	..
Injured	17	21	789	199
(b) In train-service accidents				
Killed	..	1	6	4
Injured	124	117	789	785
Travelers not on trains:				
Killed	2	..	2	4
Injured	61	54	426	437
Employees on duty:				
Killed	18	21	117	111
Injured	1,570	1,504	9,149	8,247
All other nontrespassers:**				
Killed	69	101	650	670
Injured	347	422	2,623	2,617
Total — All classes of persons:				
Killed	190	193	1,187	1,111
Injured	2,222	2,195	14,183	12,639

*Train accidents (mostly collisions and derailments) are distinguished from train-service accidents by the fact that the former caused damage of $375 or more to railway property. Only a minor part of the total accidents result in casualties to persons, as noted above.

**Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers*, were as follows:

Persons:				
Killed	68	89	642	611
Injured	233	266	1,812	1,797

Fast Service Seen Key to More LP-Gas Carloadings

Up to 7,750 additional carloads a month would be available to railroads if they cut four days off the average turn-around time of LP-gas tank cars, according to spokesmen for the Liquefied Petroleum Gas Association.

Average turn-around time for the cars is now 20 days, 120 railroad traffic and operating men were told at a meeting in Chicago sponsored by the LPGA.

Association representatives urged railroads to handle LP-gas tank cars with the same speed they use in moving perishable products, claiming that such service would help eliminate winter transportation bottlenecks.

Faricy Says RRs Must Maintain Spending Pace

"To keep abreast of national needs," AAR President W. T. Faricy told the National Association of Shippers Advisory Boards at Los Angeles last week, the railroads should continue to spend each year at least the $1,309 million they are expected to spend on improvements this year.

"But in this day when freight cars which cost $2,500 are being replaced with cars which cost $8,000," he said, the total of railroad depreciation and retirement charges "does not begin to be enough" even when combined with what is realized from equipment obligations.

Funds to finance needed capital expenditures, Mr. Faricy declared, "can come only from earnings or such a prospect of earnings as will furnish a sound basis of credit."

Mr. Faricy also observed that railroad management is faced not only with problems of how to raise funds but also the "problem of judicious apportionment of severely limited means so as to best meet virtually unlimited needs."

D&H Asks Employees for Capital Betterments Ideas

The Delaware & Hudson has turned to its employees for suggestions as to what capital improvements it should plan for 1957 to provide more efficient operations and better service, and better and safer working conditions.

J. P. Hiltz, Jr., vice-president, operations and maintenance, has addressed a letter to all D&H employees asking them to submit their ideas and recommendations for inclusion in next year's budget, which is expected to include about $8 million for capital improvements.

Recommendations will be reviewed at a meeting of 240 supervisors, department heads and project sponsors at Albany October 30.

Supply Trade

John S. Hutchins has been elected executive vice-president of **American Brake Shoe Company,** and **Charles M. Ruprecht** has succeeded him as president of National Bearing Division. Mr. Hutchins, a director, was formerly vice-president of the parent firm and

John S. Hutchins

Charles M. Ruprecht

president of two company divisions, National Bearing and Ramapo Ajax. He will continue as president of the latter. Mr. Ruprecht was formerly executive vice-president of National Bearing Division in St. Louis.

Gerald J. Weihofen has been appointed railroad industry specialist for **Kaiser Aluminum & Chemical Sales, Inc.,** at Chicago. He was formerly western mechanical editor for **Simmons-Boardman Publishing Corporation.**

Ogontz Controls Company has appointed **Bruce C. Gunnell** railroad representative in the southeastern states.

R. G. Wade, a member of the board of directors and treasurer of **Fairmont Railway Motors, Inc.,** has been elected vice-chairman of the board, president and general manager, with general supervision over the affairs of the company. **W. F. Kasper** has retired as president and general manager, but will continue as chairman of the board and will serve as advisor on sales and products. **C. H. Johnson,** assistant to the president, has been elected vice-president and assistant general manager and a member of the board. He will assist in general supervision of the company's affairs. **Kenneth Cavins,** in charge of district sales, has been appointed vice-president, with responsibility for all sales activities throughout the United States. **W. D. Brooks,** in charge of export sales, has been named vice-president, with responsibility for sales activities in the foreign field, excepting Canada. **Ira Sublett** has been appointed chief engineer.

Expansion of the **American Hoist and Derrick Company** through purchase of the **Lebus Rotary Tool Works Inc.** of Longview, Tex., has been announced. The acquisition was an outright purchase of the complete plant, certain product inventory and major facilities of the Lebus firm, including a 20-acre site on the Texas & Pacific. **John McEvoy,** formerly general manager of American Hoist's South Kearny, N.J., operation, has been appointed general manager of the Texas plant.

Caterpillar Tractor Company has acquired the **Englehart Manufacturing Company,** Davenport, Iowa, to be operated as a wholly owned Caterpillar subsidiary. Englehart will continue to operate under its present name and **C. E. Murray,** president, will continue as its chief administrative officer.

Newport Steel Corporation, a subsidiary of **Merritt-Chapman & Scott,** has been acquired by **Acme Steel Company.** The new Acme subsidiary, to be known as **Acme-Newport Steel Company,** will continue to produce its present line of products, which will be augmented by additional steel specialties.

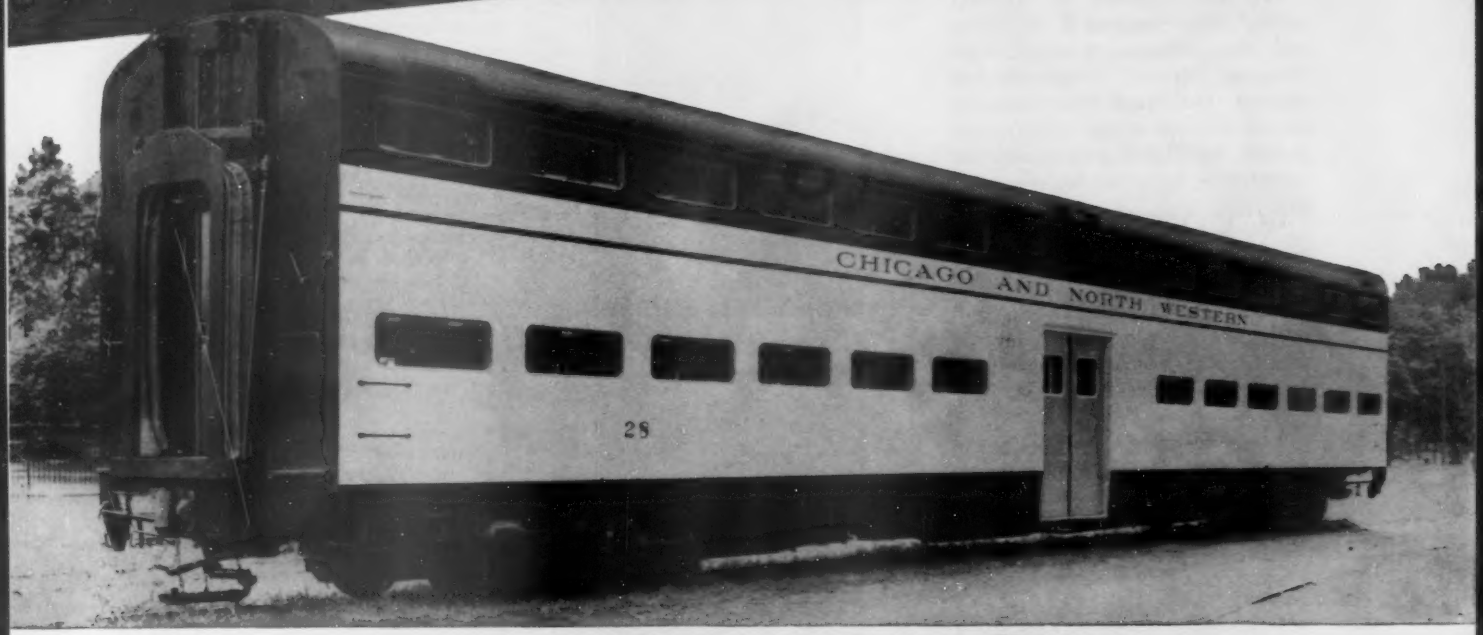
United States Steel Corporation has named **Lewis T. Gibbs** manager, and **Stanley C. Lore** assistant manager of the high strength steel sales division. Mr. Gibbs, who succeeds **M. B. Sunderland,** retired, served as assistant manager of railroad sales and as assistant manager of high strength steel sales before his new appointment.

OBITUARY

Samuel G. Allen, 86, retired chairman of the board of Franklin Railway Supply Company, died October 16, at Pinehurst, N. C. Mr. Allen had also served as an officer or director of other companies in the railway supply field, including Combustion Engineering, Inc., G. M. Basford Company, Lummus Company and Lima-Hamilton Corporation.

A Message to Management . . .

6,400 passenger cars have been built



COMFORTABLY SEATING UP TO TWICE AS MANY PASSENGERS as previous commuter cars – the C&NW "Superbanite" double-deckers show the "new look" in suburban equipment. They will be extensively used on all three of the North Western's suburban divisions. Note the pneumatically operated center doors that speed up movement onto and off the cars. Steps are radiant heated to prevent accumulation of ice and snow in winter.

UPPER DECK of the "Superbanite" has seats along each side. Large baggage racks for coats and parcels are in the area over the center aisle. Foam rubber cushioned seats set on 33½-in. lower level centers. Focusing incandescent lights over each seat provide ample and pleasant illumination.

THE "SUPERBANITE" CAR is divided into two sections from the center entrance. Four stairways to the upper deck are directly adjacent to the center entrance. Lower seating area features ample head room as well as ample leg room. Passenger comfort is a prime consideration in the construction of this equipment.

better with USS COR-TEN Steel since 1933

C&NW's "Superbanite" double-deckers are built with USS COR-TEN Steel

to hold dead weight to a minimum and ensure maximum operating efficiency

APTLY NAMED, the 48 "Superbanite" double-decker coaches, the first of which were put into service by the Chicago and North Western Railroad in 1955, are the last word in commuter cars . . . for they offer full air conditioning, main line rideability, easy boarding and leaving, ample leg room and a host of other conveniences, all designed to make commuting more comfortable and pleasant.

By increasing car height to 15 ft. 10 in., it was possible to add a single row of seats in a gallery along each side of the car, boosting seating capacity from the former 80 and 85 passengers to 161 in the equipment being delivered this year, and to 169 in the cars on the original order. This whopping increase in capacity gives these cars the largest capacity of any coach in the country. Equated into the $7,000,000 cost of the 48 double-decker fleet, the cost per seat averages only $891—a big economic feature of the railroad.

Equally important from an economic point of view was the use of USS COR-TEN high-strength low-alloy steel for the car bodies. The high yield point of COR-TEN Steel (50,000 psi) and its high resistance to atmospheric corrosion, 4 to 6 times that of structural carbon steel, make possible the safe reduction of dead weight and at the same time ensure a minimum of maintenance cost for many years.

Loaded weight for each "Superbanite" car averages only 163,290 lb. compared to 112,700 lb. for the older 80-85 capacity coaches—an average of 996 lb. per passenger as against 1,366 lb. per passenger. USS COR-TEN Steel construction helped make this possible.

The 48 "Superbanite" cars which have been put into service by C&NW (16 built by St. Louis Car Company, 32 built by Pullman Standard) offer a total seating capacity of 7,856—the equivalent of approximately 100 cars of conventional design.

• • •

Some 6,400 passenger cars built with USS COR-TEN Steel have been put in service by 52 railroads in the United States and Canada since 1933.

The ability of this equipment to attract passenger traffic and to keep operating and maintenance costs low are potent reasons why this superior structural steel is so widely used today in equipment that ranks as the most efficient and most profitable on the rails. For not only does USS COR-TEN Steel provide strength, stamina and durability to a high degree, but it lends itself readily to difficult design problems and advanced fabricating techniques. These advantages, and the fact that USS COR-TEN Steel is comparatively low in cost, recommend it to your serious consideration.

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

Railway Officers

AKRON, CANTON & YOUNGSTOWN.—Dr. Paul M. Zeis, executive assistant vice-president, accounting and finance, elected vice-president, research, Akron, Ohio.

Robert J. Laidlaw appointed general agent, New York.

BANGOR & AROOSTOOK. — Armand Duplessis, chief clerk, Northern Maine sales office, Presque, Isle, Me., promoted to assistant general freight agent.

Liston F. Lewis, associate editor of "Maine Line," BAR employee magazine, appointed assistant director of personnel, Bangor.

CENTRAL OF GEORGIA. — Ecratus Sandlin, car accountant, Savannah, Ga., retired September 30. **John H. Footman,** superintendent of mail and express, Savannah, appointed superintendent car accounting, mail and express.

James F. Becton, traveling auditor, appointed to new position of director of research—efficiency, Savannah, Ga., reporting to vice-president and comptroller.

CHESAPEAKE & OHIO.—R. E. Bryan, fuel purchasing agent, Cleveland, named general fuel purchasing agent there. He has been succeeded as fuel purchasing agent by **S. D. Riling. M. H. Priddy,** tie and lumber agent, Cleveland, appointed general tie and lumber agent and has been succeeded as tie and lumber agent by **H. K. Wyant.**

CHICAGO NORTH SHORE & MILWAUKEE.—S. W. M. Heckler appointed general eastern agent, Jenkintown, Pa.

BESSEMER & LAKE ERIE.—Richard B. Hood (above), assistant to president, Pittsburgh, elected secretary-treasurer of this road, the Union and Youngstown & Northern, in addition to his present responsibilities. Edward C. McHugh vice-president and secretary-treasurer, retired.

GULF, MOBILE & OHIO.— Clyde E. Jensen named district freight agent, Indianapolis, to succeed **Charles M. Ashworth,** who retired September 30.

MILWAUKEE.—L. G. Cronin, storekeeper, La Crosse, Wis., appointed division storekeeper, Miles City, Mont. Because of a printer's error, Mr. Cronin's name was misspelled in Railway Age, Oct. 8, p. 46.

Edwin R. Eckersall, assistant general counsel, elected general solicitor, Chicago, effective November 1, succeeding **Thomas H. Maguire,** resigned to become chairman and counsel, executive committee, Western Traffic Association. **Edwin O. Schiewe,** general attorney, promoted to succeed Mr. Eckersall.

MISSOURI-KANSAS-TEXAS. — John G. Peterson, assistant secretary, and **Karl O. Jansson,** assistant treasurer, elected secretary and treasurer, respectively, succeeding **Arthur M. Jacobs,** secretary-treasurer, who retired September 1. **J. T. Stephenson,** comptroller, elected assistant secretary and assistant treasurer.

W. W. Renfro, assistant director, industrial development, Dallas, promoted to assistant vice-president, industrial development there, and **W. P. Lacy,** assistant director, industrial development, appointed assistant to the vice-president, industrial development, with headquarters remaining at St. Louis.

The North Texas, South Texas, and Northwestern divisions have been consolidated into one operating territory, designated the Southern division, with headquarters at Waco, Tex.

The following appointments announced: **R. B. George,** superintendent, Waco; **C. W. Campbell,** assistant superintendent, Wichita Falls, Tex.; and **F. H. Schaller,** assistant superintendent, Smithville, Tex.

MISSOURI PACIFIC.—W. R. Gallagher, trainmaster, Coffeyville, Kan., has exchanged positions with **W. H. Pelton,** trainmaster, Nevada, Mo.

J. H. Greason, division engineer, Wichita division, Wichita, Kan., appointed division engineer, Illinois division and Missouri-Illinois RR east of the Mississippi river, St. Louis, and **R. J. Bruce** continues as division engineer, St. Louis Terminal division, St. Louis (Railway Age, Oct. 1, p. 42). **P. P. Wagner, Jr.** named to replace Mr. Greason at Wichita.

S. Al Toroian appointed public relations representative, St. Louis. Mr. Toroian's territory will embrace Missouri, Kansas, Nebraska, Colorado and Illinois. The territory of **Malory McDonald,** public relations representative, Houston, Tex., extended to include Arkansas and Memphis, Tenn., in addition to Texas and Louisiana.

NEW HAVEN.— William T. Griffin, vice-president—law, New York, resigned September 19. **H. L. Filer,** general counsel, is now in charge of the law department.

NORFOLK & WESTERN.— Stuart T. Saunders, vice-president and general counsel, Roanoke, Va., named executive vice-president, a newly created position. **John P. Fishwick,** general solicitor, appointed general

Stuart T. Saunders

John P. Fishwick

counsel. **Robert B. Claytor,** assistant general solicitor, named assistant general counsel and **A. Paul Funkhouser,** assistant general solicitor, appointed general attorney, a new position.

PENNSYLVANIA. — Henry G. Allyn, Jr., district passenger manager, New England territory, Boston, transferred to New York, succeeding **Irvin W. MacMullin,** retired (Railway Age, Sept. 3, p. 46).

SOO LINE.—R. J. Flannery appointed general accountant, succeeding **H. E. Lundberg,** promoted to auditor of passenger and station accounts (Railway Age, Oct. 1, p. 46).

OBITUARY

John A. Long, vice-president and general manager of the **Sanford & Eastern, Hoosac Tunnel & Wilmington** and **Claremont & Concord** at Readsboro, Vt., died October 11.

Questions and Answers

Of current interest

to the Transportation Department

Can the practice of "prior classification" of freight cars in interline movement be more widely followed, with advantage to the carriers. . . .

?

CONDUCTED By G. C. RANDALL, district manager, Car Service Division (ret.), Association of American Railroads, this column runs in alternate weekly issues of this paper, and is devoted to authoritative answers to questions on transportation department matters. Questions on subjects concerning other departments will not be considered, unless they have a direct bearing on transportation functions. Readers are invited to submit questions, and, when so inclined, letters agreeing or disagreeing with our answers. Communications should be addressed to Question and Answer Editor, Railway Age, 30 Church Street, New York 7.

Yes—under certain conditions.

We noticed that at the 1955 meeting of the American Association of Railroad Superintendents one of the committee reports advocated more prior classifications of freight cars in interline freight movements (p. 115, Proceedings). Naturally this involves one road doing some of the classification hitherto or presently done by another. Since apparently it is generally agreed that such prior classification is desirable, from a service point of view at least, the following questions suggest themselves:

1. Interline traffic, is the practice being followed as widely as it ought to be?

2. If not, what would seem to be the reason why the practice has not been adopted more widely?

This same committee of the AARS recommended "establishing more solid trains of a single classification." Again some questions arise:

1. In some cases might not such a policy lead to substantial delays at one terminal awaiting enough cars to put in such a classification, just as holding for tonnage is said to do today?

2. Might not such a policy lead to a need for larger yards, so cars could be held awaiting the time when such solid trains were moved?

3. Would not such a policy suggest reconsideration of the whole policy of classification so it might be planned on a system basis?

We asked these questions of a number of people. Below is one reply. As usual, we'll welcome comments from any of our readers—*G.C.R.*

"Classification of through traffic over terminals in interline movements is practical only in a few operations where the connecting lines have a mutual interest and sufficient volume in making these through classifications. There are attendant certain advantages and disadvantages and the parties who have agreed to such overhead classification in interline interchange must weigh the benefits that each may derive against the added expenses, also the overall benefit thus accruing to the public.

"It may be assumed that such a practice might be expanded upon.

"The through classification for interline freight movements will in most instances require additional yarding and classification facilities and additional supervision to determine where such through classifications will actually be of benefit in the overall movement. There is also the question of additional car hire cost which may result from the assemblage of grouped traffic.

"With reference to your questions concerning establishing more solid trains of a single classification, the first big problem is volume. If the traffic is held until sufficient volume is assembled for a solid train, chances are that in the overall picture severe delays will occur.

"The railroads' patrons have geared their operations to the shipment and receipt of freight traffic on a scheduled basis, and such schedules could not be maintained if traffic were assembled for larger groupings and single classification trains. On a system basis, a good many railroads are now following large group classifications within the framework of their advertised freight schedules." —*C. H. Sauls, vice-president—operations, Seaboard Air Line.*

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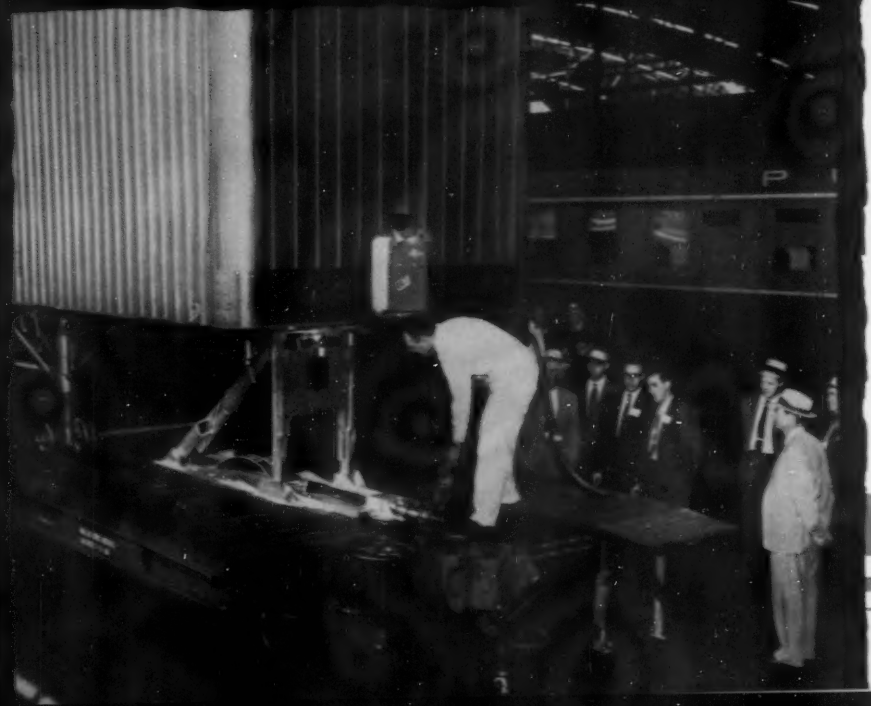

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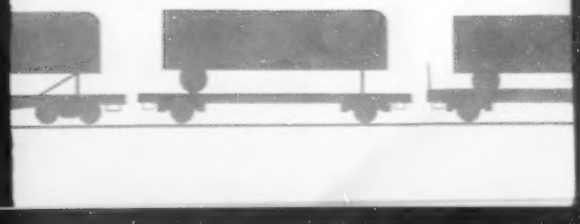

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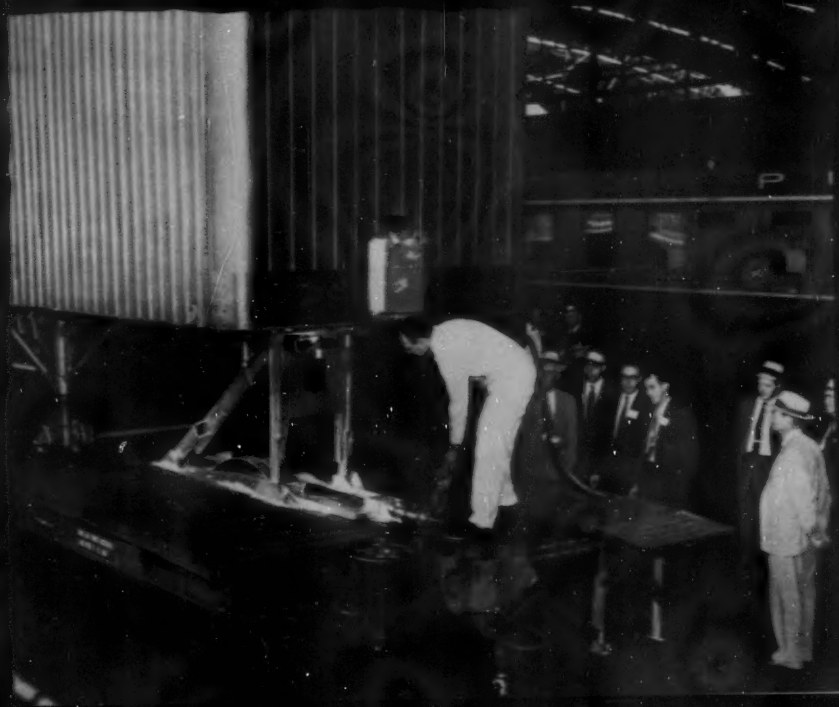

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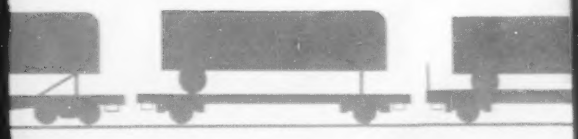
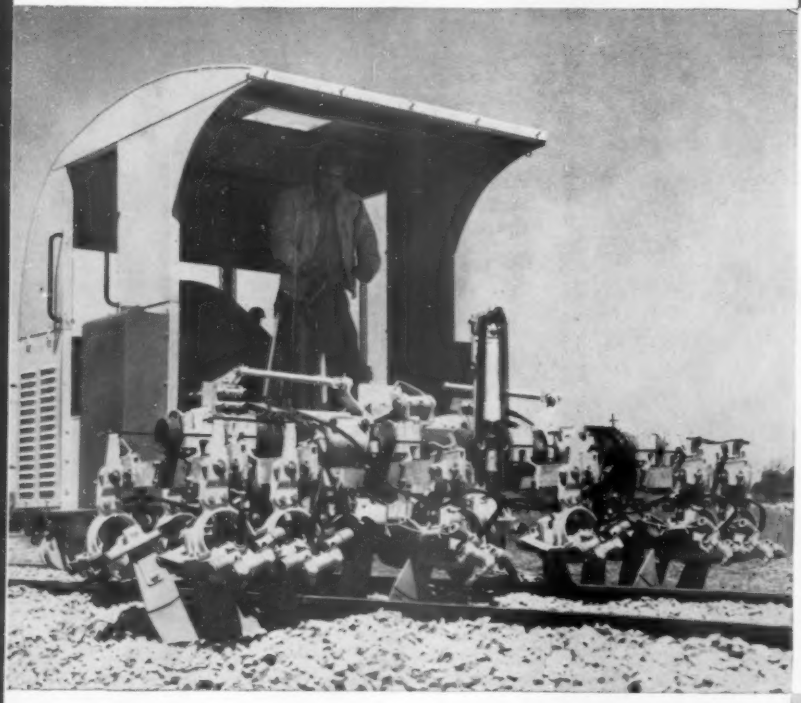


from GANDY-DANCER to . . .



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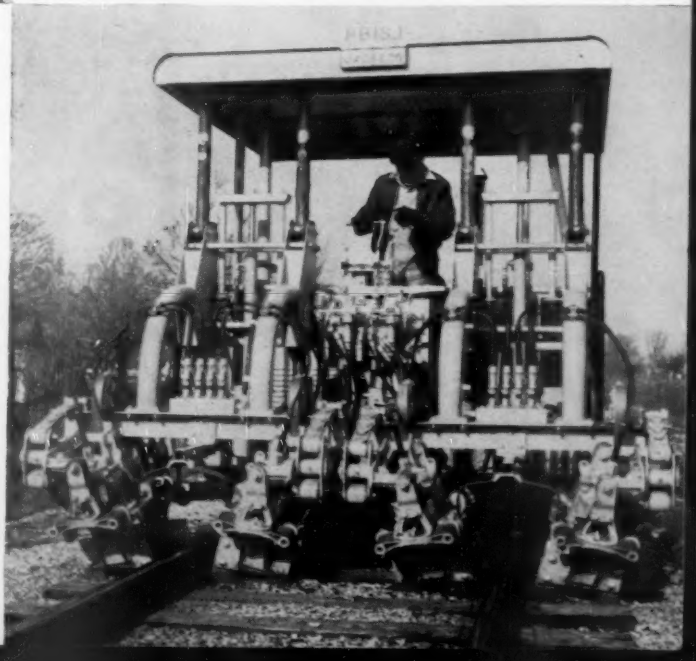

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How to Find More Time to Think

In our Centennial Issue, published last month, one of the nation's able and widely known industrial traffic executives—Andrew Anderson of Socony Mobil Oil—made this significant observation:

"Since World War II each transport agency has been engaged in a titanic struggle with the others for what is known as its 'share' of the traffic. The assumption on which this struggle has been based—namely that there are such phenomena as permanent movements of traffic to be shared—is false.

"The next ten years may see the disappearance of much present traffic and the creation of new traffic."

Mr. Anderson went on to warn that, unless the railroads are alert to the changes taking place in distribution patterns, much of their existing traffic may vanish. Meantime, other transport agencies may seize the opportunity and be the ones which capture the new traffic flow.

More Mechanization Coming

In another article in the same issue, H. L. Hamilton—the man who, more than any other one person, is responsible for the revolution which has occurred in railroad motive power—had this to say:

"The vital importance of our railway trackage and private transportation right-of-way to the country's economy and well-being will be more appreciated in the near future. . . . There are apparent many forces, both social and economic, now in motion which will dominate the course of events. . . .

"What we can look forward to is a highly mechanized automatically operated ground transportation system—actually a metamorphosis of our present railway system."

Neither Mr. Anderson nor Mr. Hamilton are professional prophets—but both of them are competent and successful transportation men. Both of them have been prominently identified with widely different aspects of spectacular changes which have occurred in transportation methods during the past 25 years; and foresight unquestionably had a lot to do with the achievements of both of them. Hence, what they predict for transportation in the period ahead is certainly worthy of respectful attention and careful inquiry. But how many people are there in the railroad industry who have really got the time to do the inquiring? Whose responsibility is it to do it? One of the most devoted and best informed friends the railways have in academic circles writes us, in part, as follows:

"How many top-management railroaders do you know who have enough time to lay aside routine and just plain think and speculate for two days in a row? Or, to put it differently, how many railroads would permit a man to observe, ask questions, think, write, ask more questions, discuss—and then write some more? Wouldn't they begin to load him with day-to-day routine, tend to look at him as excess baggage, or to consider him as a day-dreamer?

Not Enough Men at the Top

"Railroads have something like a $30 billion plant; they play a more intimate role in the daily lives of all of us than *any* other industry. Yet, quantitatively, they're thin at the top; there just *aren't* enough men to have, among them, the *ideas* it requires to keep pace in America, 1956 vintage. I'm not saying the men at the top don't have ideas; there just aren't enough of them.

"Why? Basically, perhaps, because there's more to running a railroad than administering for carrying goods and people, yet a reluctance to have the men required to do these non-visible, non-tangible jobs leaves the roads short-handed. You know, and I guess most top-flight railroaders do, that industry relations (i.e., with other industries and the nation at large), government relations, labor-public-stockholder relations all require *broad*, non-technical comprehension of the kind of day and age we're living in. You just don't run those phases of the business the way you run the operating or transportation departments. They need *more* help, and the right *kind* of help—mostly, I think, from men with broader backgrounds who possess what too many people don't have, a sense of relevance of the particular to the general.

"The 'practical facts' don't show that the railroads are doing so well. What I think they need is fewer specialists and more generalists, fewer top sergeants and more generals.

"Whether there are enough railroaders who can be spared to find out the things there are to be discovered about the potential of the railroads in America, I wouldn't know. If there aren't enough (and there probably aren't), then the only alternative is to bring in more from the outside—preferably seasoned men with experience in progressive industries that—as all of them do—have close contact with moving freight. They would have to be well paid and their employers would have to understand that they were not to expect anything tangible (so many tons of new business, so many hours of routine work accomplished), but rather *ideas* which are worth trying out.

"The railroads will not be doing right by themselves and the nation unless they can take more time to think. The first step is more thinkers—the next, broader thinking."

MANUFACTURERS STATE THEIR CASE . . .

Solid Bearings = Economic Bearings

Intensive study of the economics of roller bearings for freight cars has been under way for several years. The 1951 annual meeting of the Railroad Division of the American Society of Mechanical Engineers considered a report of one such study (Railway Age, Dec. 31, 1951, p.37, and Jan. 7, 1952, p.63), and another was released last summer (Railway Age, July 30, 1956, p.26).

The figures and opinions set forth by proponents of roller bearings have, however, not been universally accepted. The Technical Advisory Committee of Solid Journal Bearing Manufacturers* has just completed an appraisal of the freight car bearing situation which, in many respects, is a "rebuttal" to the reports mentioned. That new study is the basis of this article. For it, Railway Age, as always, makes its pages available for full exposition of all aspects of controversial questions important to the railroad industry.

*Consisting of the Canadian Bronze Company, Magnus Metal Corporation, National Bearing Division of American Brake Shoe Company, and Railway Service & Supply Corp.

Today railroad officers understandably are seeking means to improve freight service and cut operating costs by reducing road failures of bearings. How best to accomplish these ends is a principal concern of this article.

History and Background

In November 1955 the AAR Mechanical Division published a study of "Comparative Economics of Journal Bearings"—the results of an investigation made at the request of the AAR Board of Directors. Though not yet released for general publication, this AAR report has been widely circulated within the industry. In brief, its findings are that the current price of any roller bearings for freight cars is too high to permit recovery of the investment—and that from an economic standpoint roller bearings could not be expected to pay their way. These findings were established after granting to the "unproved" low-capacity roller bearing a life expectancy and failure incidence of 75% of the heavy-duty passenger car bearing—a figure which the Technical Advisory Committee considers far in excess of that justified by their respective service conditions.

The existence of the AAR study has prompted a wide resurgence of roller bearing publicity in an effort to counteract its influence. The most recent, and a typical example, is the Timken brochure "The Use of Roller Bearings on Freight Cars"—reviewed in the July 30 Railway Age. In brief, this Timken study, according to the Advisory Committee, "exaggerates solid bearing costs, minimizes or ignores comparable roller bearing costs, and arrives at a break-even point almost three times that established by the AAR." This extreme variation between "unbiased AAR findings" and the Timken study's figures has prompted a close examination of their major differences.

Solid Bearing Costs

The Advisory Committee says that, in the calculation of solid bearing costs, Timken has committed several serious mistakes. In the first place, Timken assumed that 6,000,000 solid bearings were applied to existing freight cars in the year 1954. As solid bearing manufacturers the committee is in a position to state accurately that only 4,360,000 solid bearings were purchased by American and Canadian railroads for freight car maintenance in that year —with approximately 600,000 additional bearings used on passenger cars and new freight cars.

A second serious error, according to the Advisory Committee, is that Timken has charged against the solid bearing assembly all accidents resulting from broken journals—regardless of cause. This means that solid bearings have been charged with 41 accidents caused by Journals Broken, Due to Defects (ICC Code 2419) and 206 accidents due to Journals Broken, Other Causes, (ICC Code 2421), in addition to the 391 accidents specifically ascribed by the ICC to Journals Broken, Overheating. At the same time, Timken has estimated comparable charges against roller bearings by using the same cost per accident as with solid bearings, coupled of course with an extremely low accident rate.

Actually in 1954, 4,109 derailments from all causes were reported. This means that better than 90% of all derailments resulted from causes unrelated to journal bearings. If roller bearings were prevalent, the cost per accident for damage to equipment would have to be increased for all accidents to provide for replacement of expensive roller bearing cars. These costs, as well as costs solely chargeable to roller bearing failures, should certainly be considered in any comparative economic study, says the Advisory Committee.

Third, according to the committee, Timken has more than doubled the incidence of cut journals found during routine inspection and repacking over the comparable incidence developed by the AAR. The AAR study reports a total of 110,516 cut journals found during these inspection periods, whereas Timken calculates comparable costs on the basis of 258,251 cut journals. The committee considers it extremely doubtful that the latter figure will bear up under careful examination.

But what the committee calls by far the most serious error in the Timken study is the "huge" expense charged against the solid bearing for locomotive and car delays based on problematical earnings and cost of car ownership as related to average

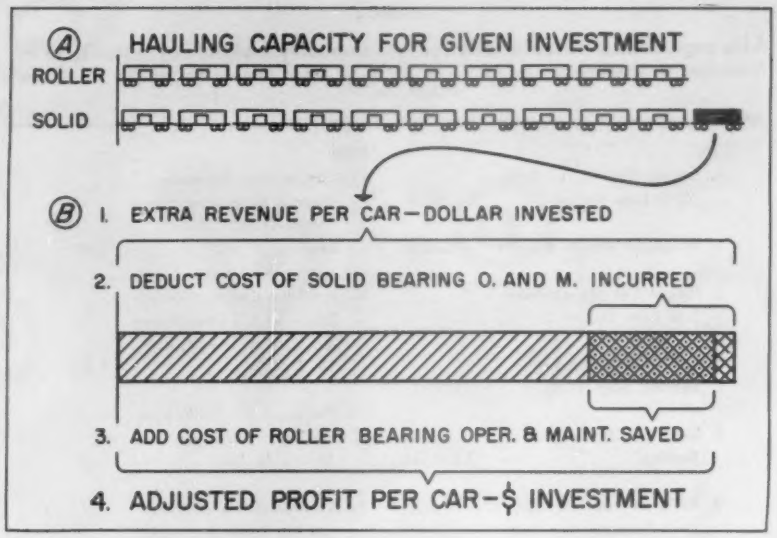
car shortages and surpluses in a given year. These charges, reaching a total of over $107,000,000 per year, of 48% of the total presumed savings, were specifically disallowed in the AAR study after thorough investigation and analysis.

Roller bearing proponents have always contended that earnings are lost because of delay days and that these problematical earnings can be counted as costs for solid bearing operation. The Advisory Committee asserts that they also have always exaggerated the number of delay days per solid bearing car in order to contend for an economic advantage.

The committee says it is unsound to consider problematical earnings as costs. If prospective earnings justify additional investment to increase hauling capacity, it should be borne in mind, it says, that for the same amount of money required to buy a given number of roller bearing cars, up to 10% more cars with solid bearings can be purchased—resulting in up to 10% additional available car days. This means an increase in up to 10% more revenue for the same initial investment, less the difference, if any, in the expense of maintaining bearing assemblies on the two groups of cars. Should these extra cars not be needed, the initial investment can be reduced by approximately 10% and the return per car dollar invested would show a significant increase (up to 10%) over the same investment made in roller bearing cars.

Likewise, from a practical standpoint, it is impossible to relate any increase in available car days to a reduction in equipment. To illustrate: in 1950 the railroads with 1,721,269 cars moved 38,902,641 carloads of freight, whereas in 1954 with 1,736,057 cars 33,914,953 carloads were moved. The cars were loaded 22.6 times, or once each 16.15 days, in 1950; and were loaded 19.5 times, or once each 18.7 days, in 1954. If in 1954 cars had been loaded at a rate of 22.6 times per year, as in 1950, theoretically only 1,500,662 cars would have been required.

Actually, no such car saving could ever be effected, because the railroads' car inventory requirements are determined by peak loads and seasonal demands of specialized commodities—grain, coal, etc. The car pool, like working capital, must be sufficient to meet any emergency.


A
HAULING CAPACITY FOR GIVEN INVESTMENT
ROLLER
SOLID
B
1. EXTRA REVENUE PER CAR—DOLLAR INVESTED
2. DEDUCT COST OF SOLID BEARING O. AND M. INCURRED
3. ADD COST OF ROLLER BEARING OPER. & MAINT. SAVED
4. ADJUSTED PROFIT PER CAR—$ INVESTMENT

If what it calls realistic solid bearings costs for damage to equipment, for cut journals found during routine inspection and periodic repacking, and for bearing consumption are used, and if exorbitant costs for delays are eliminated from consideration, says the Advisory Committee, the annual savings per car with roller bearings would not be sufficient to justify their use—even using the Timken figures.

Roller Bearing Life Expectancy

From an engineering analysis, however, the committee finds indications that the 25-year life and average annual replacements of 1.9% which Timken has assumed may never be realized with the low-capacity roller bearing. Should this life expectancy not be reached it would seriously affect the Timken estimates of hot box costs, damage to equipment, and inspection periods—as well as annual replacement costs. There follows a digest of the Technical Advisory Committee's examination.

"The commonly accepted figure for roller bearing life in passenger service is 25 years. The low-capacity freight car roller bearing is said by its manufacturers to have a service life of only one-fifth the passenger car roller bearing. If then, we evaluate the life expectancy of the passenger car roller bearing in freight service, and divide by 5, we can arrive at a reasonable life expectancy of the thus-far-unproved, low-capacity freight car bearing.

"Obviously, there are many conditions in freight car service that are different than passenger car service, and they all have an effect on bearing life. Five principal factors can be used to correct for these differences. These are the Load Factor, Mileage Factor, Speed Factor, Impact Factor, and Vibration-Thrust-Brake Load Factor. Each one of these factors has been assigned a numerical value, and their product gives a Comparative Life Factor which multiplied by passenger bearing life and divided by 5, yields a reasonably accurate estimate of the freight car bearing life. Thus, when:

L_f = Freight Car Bearing Life in Years
L_p = Passenger Car Bearing Life in Passenger Service in Years, or 25
W = Load Factor, or 1
M = Mileage Factor, or 4.45
S = Speed Factor, or 1.58
I = Impact Factor, or .2, and
V-T-B = Vibration-Thrust-Brake Load Factor, or .85

We may derive the following formula:

$$L_f = \frac{L_p\ (W.M.S.I.V\text{-}T\text{-}B)}{5}$$

"The product of the values assigned to W, M, S, I, and V-T-B, or

TABLE I

Life expectancy calculations for low-capacity freight car roller bearing

(Projection of Comparative Life Factors of 5½ x 10 Roller Bearing for 100,000 Lb Capacity Freight Car)

ITEM		ITEM	
1. Freight Car Wt. on Rails (80% Load Factor)	135,200 Lb	11. Comparative Vibration, Thrust & Brake Load Factor Freight Over Passenger Bearing	0.85
2. Weight of Wheels & Axles	9,000 Lb	12. Projected Comparative Life Factor Freight Over Passenger (Product Lines 7, 8, 9, 10 & 11)	1.196
3. Freight Car Wt. on Bearings (Line 1—Line 2)	126,200 Lb	13. Passenger Car Roller Bearing Life in Passenger Service in Yrs.	25
4. Load per Freight Car Bearing (Line 3÷8)	15,775 Lb	14. Theoretical Life of Passenger Car Roller Bearing in Freight Service in Years (Line 12 x Line 13)	29.90
5. Load per Passenger Car Bearing	15,775 Lb	15. Theoretical Life of Freight Car Roller Bearing Over Passenger Car Roller Bearing (Timken Report)	0.20
6. Ratio of Load Freight Over Passenger Brg. (Line 4/Line 5)	1.0	16. Projected Theoretical Life of Freight Car Roller Bearing in Freight Service in Years	5.98
7. Comparative Load Factor Freight Over Passenger Bearing	1.0	17. Life of the Freight Car Roller Bearing Compared to the Passenger Car Roller Bearing (Line 16/Line 13)	23.92%
8. Comparative Speed Factor Freight Over Passenger Bearing	1.58		
9. Comparative Mileage Factor Freight Over Passenger Bearing	4.45		
10. Comparative Impact Factor Freight Over Passenger Bearing	0.20		

the Comparative Life Factor, is 1.196. This value, applied to our equation, establishes a life expectancy for the low-capacity roller bearing of just under 6 years.

"How the values for the component factors are determined is explained below.

"Load Factor—The AAR Committee on Journal Roller Bearings in Circular D.V.-1361 of May 26, 1956, recommends that 'Freight car roller bearings be designed for a minimum life expectancy of 500,000 miles service with a load factor of 80%, equivalent to full rail load in one direction. "Life expectancy" is defined as that life at which 10% of the bearings may have been replaced for fatigue.' 80% of the full load rail weight of the 169,000 pounds is 135,200 pounds rail weight. This rail weight, less wheel and axle weights of 9,000 pounds, amounts to a weight per bearing of 15,775 pounds.

"The maximum load per 5½ by 10 in. axle permitted in passenger service is 34,000 pounds for speeds up to 85 mph (AAR Manual, page D-4-1956). Over 85 mph, it is limited to 32,000 pounds. Assuming 50% of passenger cars are sometimes used in maximum speed service, the average maximum weight imposed on the passenger car axle is 33,000 pounds and on the bearing it is 16,500 pounds. For all practical purposes, the average passenger carload per 5½ by 10 bearing is the same as the 80% loaded 5½ by 10 freight car bearing, since the passenger cars average 95% of maximum permissible weight on axles (16,500 lb x .95 = 15,675 lb). Therefore, the load factor for a freight car roller bearing compared to a passenger car roller bearing is 1.0.

"Speed Factor—Average passenger train speed on 52 Class I railroads in the United States was 38.4 mph in 1954 and 38.9 mph in 1955 (Report M-200, Interstate Commerce Commission).

"Passenger car wheels are 36 in. in diameter and freight car wheels 33 in. in diameter. Since journal speed in rpm is the speed to be considered for capacity of roller bearings, the average passenger car speed has to be decreased 8.33% to compensate for wheel diameter. Therefore, the average passenger car speed for 1954 and 1955 is $\frac{38.4 + 38.9}{2} \times \frac{33}{36}$, or 35.4 mph for comparative purposes.

"The average freight train speed was 18.7 mph in 1954 and 18.6 mph in 1955 (1955 Year Book—Eastern Railroad Presidents' Conference, page 45). These speeds include all stopped time, waiting time on sidings, time for switching, pick-up and set-out, which would increase these speeds at least 20%, based on field test data available from several railroads. It is estimated that average freight train *running* speed today is $\frac{18.7 + 18.6}{2} \times 1.20$, or 22.4 mph.

The Speed Factor then is $\frac{35.4}{22.4}$, or 1.58.

"Mileage Factor — Average journal revolutions per year is the function that affects bearing life, not car-miles. Passenger car-miles must be multiplied by $\frac{33}{36}$, or .9166, to be equivalent to freight car-miles for the same number of journal revolutions.

"The national average passenger car annual mileage is 78,700 and the average freight car annual mileage is 16,200. The Mileage Factor then is $\frac{78,700}{16,200} \times .9166$, or 4.45.

"Impact Factor—The increased impact to which a freight car bearing is subjected over that imposed on the passenger car bearing is the most serious factor affecting bearing life. Coupling shock is the principal cause of brinnelling, surface cracking, flaking and shell-out of rollers on both inside and outside races. The small areas of contact between

the rollers and the races are highly stressed in compression by this shock impact to the point that load bearing surfaces are deformed beyond their elastic limit. Cracks can be started which shorten the useful life of the bearing and cause failures in service.

"Despite the existence of standard instructions limiting freight car coupling impact speeds to 4mph, from a practical standpoint these speeds are often exceeded. Coupling speeds of 6 mph in hump yards and classification yards are common and may be considered the average. Passenger cars, on the other hand, are coupled at maximum speeds of 2 mph, or at one-third the speed of freight cars. Since the energy of impact varies as the square of the speed, coupling shock then is at least 9 times more severe in freight service.

"Freight cars are also coupled at least eight times as often as passenger cars per year so overall coupling shock as a factor in bearing life is estimated as 72 times as severe.

"It is therefore conservatively estimated that from the standpoint of impact the life of a roller bearing in freight service will be only one-fifth of the life of the same bearing in passenger service, giving an Impact Factor of .20.

"Vibration - Thrust - Brake Loading—Freight car wheel treads receive less maintenance than passenger car wheel treads, increasing damaging journal vibration and decreasing the life of freight car roller bearings. Freight cars travel over track on sidings, in freight yards, on spurs and on branch lines seldom traveled by passenger cars. Such track is maintained at a lower standard where no passenger comfort is involved. This causes impacts and concentrated loads to be imposed on freight car bearings to which passenger car bearings are seldom subjected.

"Passenger car trucks are so designed as to impose much lower thrust loads on the bearing than in the case of freight car trucks where the side frame of the truck is restricted in its lateral movement by the bearing. Thrust loads on passenger car bearings are imposed by axle lateral forces only. Thrust loads on freight car bearings consist of the substantial increment imposed to help hold the truck side frames in place in addition to the axle lateral forces.

"Passenger cars have clasp brakes with opposing shoes on each side of the wheel that neutralize braking forces and do not increase bearing loads.

"Freight cars use a single shoe per wheel, exerting a pressure of 4,000 pounds against the wheel in a service application, so the bearing load is increased during braking by the amount that the resultant of vertical load and braking pressure exceeds the vertical load. This amounts to about 2%. *During braking* this increased bearing load decreases the life to $\frac{1}{1.02^3}$ or 0.94, a reduction of 6%. Considering all these factors, it is estimated that they will shorten the life of a roller bearing in freight service by 15%. This factor of .85 is used to compare life of the freight car roller bearing to the passenger car roller bearing as related to these conditions.

TABLE II

Annual costs per car

	Solid Bearings	Roller Bearings
Repairing hot box set-outs	$ 9.05	$ 0.59***
Damage to equipment—overheated journals broken	2.01	0.06***
Fires due to hot boxes	0.29	0.01***
Cut journals found due to routine inspection and periodical repacking	1.35	....
Defective bearings found during routine inspection other than wheel renewal and periodical repacking	2.69**	....
Periodical lubrication per AAR Rules 66 and 66-A	11.10	4.78
Labor—not included above		
Routine yard inspection and service	40.82	15.17
Cleaning and repacking journal boxes; wheel defect removals	0.20	....
Applying spring packing retainers	0.08	....
Nine year roller bearing inspection	....	2.53***
Replacing defective bearings	....	2.46
Material— not included above		
Defective bearing replacements	4.36**	47.05*
New axles (replacements)	3.35	4.13
Journal box oil or roller bearing grease and solvent	2.87	0.54
Prepared packing, journal box lids, spring packing retainers, bearing wedges, dust guards	3.20	....
GRAND TOTALS	$81.37	$77.32
ANNUAL DIFFERENCE PER CAR THROUGH USE OF ROLLER BEARINGS:		$ 4.05

* Roller bearing cost calculated thus:

Timken figure for bearing, 25 year life	$11.29	
Six-year life correction factor (25 ÷ 6)	x	4.167
Annual roller bearing replacement cost	$47.05	

** AAR figures corrected for 4,500,000 bearings per year.

*** AAR figures—subject to adjustment upward to reflect 6-year roller bearing life rather than 25-year roller bearing life.

What It All Adds Up To

"The product of all the above factors is the Comparative Life Factor, or 1.196. This factor times the 25-year life of the passenger car roller bearing in passenger service is anticipated life of that bearing in freight service, or 29.90 years. Since its manufacturers agree that the low-capacity freight car bearing will have a service life only one-fifth that of the passenger car bearing, it follows that this new bearing will last only 5.98 years.

"If the low-capacity freight car roller bearing is to have a life expec-

TABLE III

Annual labor & material costs for maintenance of solid bearing assemblies

DESCRIPTION	CURRENT COSTS (AAR)	PREDICTED COSTS
Repairing Hot Box Set-Outs	$ 9.05	$ 2.26
Damage to Equipment	2.01	.50
Fires Due to Hot Boxes	.29	.07
Cut Journals Found During Routine Inspection & Servicing	1.35	1.01
Defective Bearings Found During Routine Inspection	2.69*	1.35
Periodical Lubrication—Rule 66	11.10	5.55
Labor—not included above		
Routine Transportation Yard Inspection	40.82	24.11
Cleaning and Repacking Journal Boxes at Wheel Defect Renewals	.20	.20
Applying Spring Packing Retainers	.08	0.00
Material— not included above		
Defective Bearing Replacements	4.36*	2.18
New Axles	3.35	3.35
Journal Box Oil	2.87	1.44
Prepared Packing (Lubricators)	1.73	13.33
Journal Box Lids	.64	.64
Spring Packing Retainers	.46	0.00
Journal Box Wedges	.29	.29
Journal Box Dust Guards (Seals)	.08	1.67
TOTALS	$81.37	$57.95

* AAR figures corrected for 4,500,000 bearings per year.

tancy of 6 years or less, as is indicated by thorough analysis, it would naturally affect hot box costs, damage to equipment costs, inspection costs, etc. But the major item affected would be the annual bearing replacement cost which would soar from $11.29 per car (Timken report) to $47.05 per car. Using this figure, together with other roller bearing costs developed in the AAR study, and comparing overall roller bearing costs so determined with AAR solid bearing costs, a difference in annual costs of only $4.05 per car would result (See Table II). In accordance with the AAR formula for calculating break-even points, this would permit an investment of only $346.02 per car for roller bearings.

What of the Future?

"From a practical as well as an economic standpoint, in order to obtain better bearing performance," says the Advisory Committee, "the railroads should continue to pursue their present course of intensified development of existing bearing assemblies.

"Improved solid bearing assemblies, equipped with pad-type lubricators and the means for preventing excessive axle displacement during impacts, have already proved themselves both in the laboratory and on the road. These developments may soon be mandatory on all new equipment.

"Sufficient information is already available to permit estimates of overall operating costs when this transpires. Conservatively, based on reports published by the railroads, the incidence of car set-outs can be reduced to one-fourth the frequency experienced in 1954. This will result in corresponding reductions in damage to equipment and fires from that source. Bearing life should be doubled, and there should be at least a 25% reduction in cut journals.

"These developments also assure the practicability of 3-year intervals for periodic lubrication and inspection of bearing assemblies as required under Rule 66—halving current cost. Moreover, when used in conjunction with rear seals, they will make yard inspections on a calendar basis possible. The same number of inspectors may be required, because bearings, whether solid or roller, do not determine the size of the inspection force, but oilers' time and oil consumption will be cut in half. The effect of all these benefits on operating costs can be seen in Table III.

"These savings will be partially offset by an increase in the cost of lubricators and seals for maintenance and operation. A three year life for both lubricators and seals is assumed, with initial costs of $40.00 and $5.00 per car, respectively. No consideration has been given stores expense or scrap credits which would tend to offset each other. It is entirely possible that certain lubricators may be reconditioned for repeated re-use which would effect very substantial savings in annual replacement costs.

"It is believed that shimmed journal stops for preventing excessive axle displacement will so reduce the requirements for an economic rear seal as to make possible its development and early availability at the approximate price indicated. It is recognized, too, that the use of shimmed stops will involve slight extras for reshimming at wheel change. However, these costs for reshimming may be recovered in full measure by reduced wheel flange wear and the consequent extension of wheel life.

"Another means of preventing excessive axle displacement due to accelerating and decelerating impacts is the use of the flat back bearing. This flat back bearing has been used for years in passenger cars equipped with six-wheel trucks having only one brake shoe per wheel and has demonstrated its ability to limit axle displacement, thereby improving bearing, wheel and rear seal performance."

The Advisory Committee study arrives at this conclusion:

"Overall savings from improved lubrication and stabilized bearing assemblies (as outlined in Table III) can be realized in a relatively short period of time. This will have the following beneficial results: (1) operation and maintenance of solid bearing cars will actually cost considerably less than the operation and maintenance of roller bearing cars; and (2) solid bearing cars will continue to enjoy a very considerable advantage in initial cost."

HOW TRAFFIC CONTROL PROVIDES . . .

Maximum Use Of Single Track

- Lets trains go at once, when ready to leave yards
- Makes meets non-stop or on very close time
- Eliminates stops and delays of timetable-train order method
- Centralizes dispatching of extensive mileage in one office

The outstanding characteristic of the Seaboard Air Line is that a large volume of passenger and freight traffic is handled efficiently on a railroad that is practically all single track. The main routes from Richmond to Miami and Tampa, and Hamlet to Birmingham, total 1,607 road miles. The 12 short sections of double track, near junctions and terminals, total 107 road-miles, leaving 1,500 road-miles of single main track on these principal routes.

In some sections, this single track handles up to 14 passenger trains and 16 freights daily. As many as 1,000 freight cars are moved in each direction daily, on some divisions. Gross ton-miles per mile of road ranges up to 50,328 per day on some divisions. Fast passenger trains make the 1,040-mile run between Richmond and Miami in approximately 18 hours. Through freights provide a fast, dependable service for shippers of Florida fruits and vegetables to both eastern and western markets. How is this good job being done on single track?

One of the important reasons is that the entire route from Richmond to Miami and Tampa is equipped with modern signal systems, including dispatcher-controlled signals for authorizing train movements, obviating the train delays inherent in the timetable and train order practice.

Seaboard policy, applying to any single-track main line where signal protection is needed, is to install some form of controlled signaling, including signals remotely controlled by the dispatcher, aspects of which are used to authorize train movements.

J. T. Mitchell, division superintendent at Savannah, said: "I know from experience as a dispatcher that we could not handle the present traffic efficiently without the traffic control signaling. Previously, if a train was not ready to depart from a yard at the expected time, the dispatcher had to get out a new set of train orders, thus causing further delay to departure of 30 min or more. Now, he can give the train a signal to go practically anytime when it is ready to roll. This saves a lot of time that is not evident on the train sheets or train graph, but I see it every day.

"Our dispatchers know how each individual engineer will handle his train over every section of road, and by control of the signals the dispatchers can direct trains to make very close meets. Many meets are made with neither train being required to stop. When a passenger train is to go around a freight in the same direction, we use our TC on single track to make such a move with less delay to the freight than for such a move on double track with hand-throw siding switches and operation by train order.

"I remember numerous instances, when I was a dispatcher using train orders, when several freights and perhaps a passenger train would get

FREIGHT TRAFFIC VOLUME ON THE SEABOARD

On the average, the Seaboard moves about 500 carloads north, and the same volume south daily on the 105 miles of single track between Savannah and Gross. In a typical 31-day month, the 98-mile subdivision between Hamlet and Raleigh handles an average of 14.5 passenger trains and 16.2 freight trains daily. Also, each day except Sunday, three road switchers each make a turn run on separate sections of the subdivision, making the equivalent of a local freight each way daily the length of the subdivision. In such a month the ton-mile movement between Raleigh and Hamlet totaled 152,896,000, an average of 4,932,129 ton-miles daily.

'in the hole' to clear for some passenger train that was losing time. I could not get orders to those trains to pull out and move on, therefore they waited. Now, with TC, the dispatcher controls the signals to keep the trains all moving for close meets. The dispatchers for our entire Carolina division of 820 road-miles are right here in this office building. This is an important aid in coordinating operations, and in keeping touch with any trouble that develops."

When planning the TC on different divisions, the Seaboard adopted one of three types of layouts, depending on the volume of traffic to be handled. On the heavy traffic single-track sections—such as between Richmond and Hamlet or Savannah and Jacksonville—the signaling arrangements include power switch machines at the ends of siding and complete signaling for authorizing train movement, as well as intermediate signals so that two or more trains of the same direction can occupy the same siding-to-siding block.

In territories where there are not many occasions for operating following trains on close headway, such as either route between Hamlet and Savannah, the Seaboard installs power switch machines at sidings and dis-

HOW THE SEABOARD EMPLOYS SINGLE TRACK IN DEEP SOUTH

The Seaboard serves six southeastern states in which population, manufacturing and agricultural production have been increasing rapidly during the past decade. These increases have been the greatest in Florida, where the Seaboard has 1,410 route-miles, serving not only the major cities, but also extensive vegetable and fruit growing areas, as well as phosphate mines. Seaboard freight traffic to and from points in Florida, except Jacksonville, is funneled through Baldwin, and is routed over the cutoff via Baldwin and Gross, thus avoiding delays in Jacksonville. Thus most of the traffic to and from Florida, including that in and out of Jacksonville, must move over the 104 miles of single track between Gross and Savannah. An exception is that some traffic goes west from Baldwin, on the line through Tallahassee.

Between Savannah and Hamlet the Seaboard has two routes, both single track. The line via Columbia includes some grades and curves, especially on the northern portion. The line via Charleston has very light grades and curvature. Considerable traffic comes from the important line from Birmingham east through Atlanta and Monroe, which connects with the north and south lines at Hamlet. Thus the major portion of the Seaboard's traffic to and from Florida, Alabama, Georgia and South Carolina feeds into Hamlet, and passes over the 189 miles of single track and 64 miles of double track between Hamlet and Richmond.

On the 253 miles between Richmond and Hamlet, the Seaboard operates an average of 14 passenger trains and 16 through freights, in addition to switch runs that represent two trains over each subdivision. Between Hamlet and Savannah, via Columbia, the traffic includes 10 passenger trains and 3 freights daily. Via Charleston, there are about 12 freight trains and two local passenger trains. The Savannah-Gross section handles 10 passenger trains and about 10 through freight trains daily. From Baldwin via Wildwood to Miami, the traffic includes 8 passenger trains and about 14 to 16 freight trains daily. The line between Coleman and Tampa handles 8 passenger trains and about 8 freights daily.

patcher-controlled signals for authorizing train movements, but no intermediate signals are provided to allow a following train to occupy a siding-to-siding block with a preceding train.

No new installations of conventional single-track automatic block signaling have been made on the Seaboard for many years, because with such signaling it still is necessary to authorize train movements by timetable and train orders, the same as before the signal installation.

Prior to 1947 train movements between Coleman and Miami were authorized by timetable and train orders, and no automatic block signaling was in service. At that time, signal materials and signal construction men were scarce. In order to provide signal protection on the entire 274 miles as quickly as possible, the Seaboard installed complete automatic positive block signal protection for each north-end-of-siding to north-end-of-siding block. The project includes dispatcher control of the signals at the ends of the sidings to authorize train movements, as in traffic control, but the siding switches are hand operated, and special aspects are used to direct the hand operation of switches before entering or leaving a siding. In recent years, as materials have become more plentiful, the Seaboard is gradually installing power switch machines at sidings in this territory.

Employing these three variations, the Seaboard has a total of 1,565 miles of single track equipped with dispatcher-controlled signaling for authorizing train movements by signal indication without train orders. On 56 miles of double track, train operation is by signal indication both ways on each track. On the remaining 19 miles of double track, signal protection is provided for movement with direction of traffic.

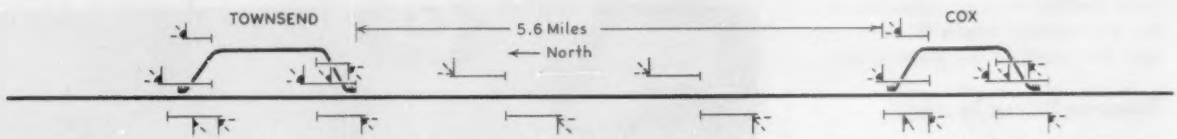
Special features of the Seaboard signaling installations, such as use of buried cable instead of pole line, and automatic changeover from centralized control to automatic control in case of failure, are described in the November Railway Signaling & Communications.

TRAINS MAKE GOOD TIME ON SINGLE TRACK

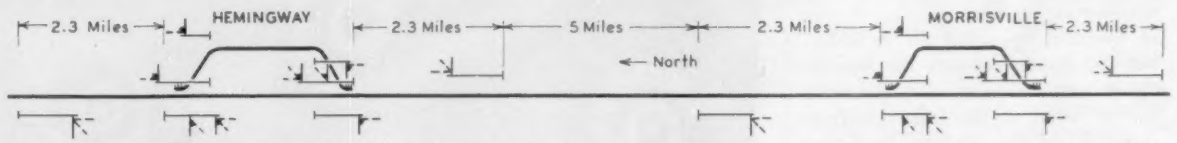
Fast passenger train No. 21, the "Silver Star," makes the 1,040-mile run from Richmond to Miami in 18 hours, 22 minutes, an average of 56.9 mph. This overall time includes six scheduled station stops and two service stops, totaling about 1 hour, as well as 16 conditional stops. On the 101.4 miles between Gross and Lane (near Savannah) this train is scheduled at an average of 66.9 mph southbound, and 71.6 mph northbound. The fact that the schedules are fast, and that the trains have good on-time performance, is proof that no time is lost in making meets.

On the various Seaboard lines that serve the fruit and vegetable areas in Florida, outgoing loaded cars are picked up in the late afternoon or evening, and are moved to Baldwin by early morning. Likewise through freights from Miami and Tampa arrive in Baldwin in the morning.

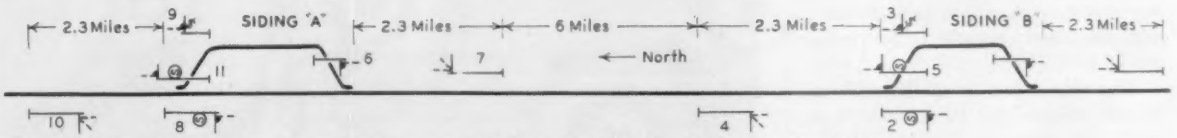
During busy seasons, from three to five sections of northbound freight No. 80, the "Marketer," are operated out of Baldwin between 8 a.m. and 11 a.m. Fast freights make the 139 miles to Savannah in about 3 hours, an average of 46.3 mph. These trains make the run from Savannah to Hamlet, 261 miles, in about 6 hours, 30 minutes, including a stop at Andrews to change crews. The run of 253 miles from Hamlet to Richmond is made in about 7 hours 30 minutes, including 25 minutes in Raleigh.



FOR HEAVY TRAFFIC the system includes power switches and controlled signals and intermediate signals for following moves.



FOR MEDIUM TRAFFIC the system includes power switches and controlled signals, but no intermediate signals for following moves.



FOR LIGHT TRAFFIC the system includes controlled signals but the switches are hand-thrown.

If a southbound train is to be directed to enter Siding "B," the dispatcher sends out a control that causes the S sign on Signal 2 to be illuminated (under a red aspect in the signal head), and approach Signal 4 displays yellow. This indicates that after the train stops at Signal 2, the trainman is to reverse the hand-throw switch, and then the train enters the siding.

If a northbound train on Siding "B" is to be directed to depart, the dispatcher sends out a control that causes an "S" sign on leave-siding dwarf Signal 3 to be illuminated. This directs trainman to reverse hand-throw switch, after which dwarf Signal No. 3 displays a green aspect, authorizing train to pull out onto main line and wait until rear brakeman places switch at normal.

These Pile Drivers Do Any Job

PLANNED FOR MAXIMUM VERSATILITY

- Air operation of the hammers
- Separate compressor cars which may supply air for other purposes
- Diesel-engine drives with torque converters and mechanical transmissions
- Hydraulic controls for raising leads and setting batter
- Equipment for jetting piles in place
- Preboring machines for hard digging and for starting longer piles
- Generators for powering floodlights and electric tools

The Santa Fe continues to maintain a large mileage of creosoted timber-pile trestles because it is convinced of their economic soundness. Therefore it has constant need for pile-driving equipment for renewing and repairing trestles and for other pile-driving jobs.

Obsolescence of its existing pile drivers had created a need for new and more efficient equipment, so the road decided to build the two new ones. Each outfit consists of the pile driver itself, built by the Orton Crane & Shovel Co., and a compressor car and an idler car, both built by the railroad. One outfit is for use on the road's Eastern lines and the other on its Western lines.

Hammer Driven by Air

Each of the drivers has a Vulcan 50C pile hammer with a rated striking energy of 15,100 ft-lb. It can be operated by either air or steam, but the Santa Fe uses air because boiler water is practically non-existent on much of the fully dieselized railroad. If the road in the future should use a self-contained diesel hammer or a hydraulic hammer, the compressor car, which is detachable, can be used elsewhere for other projects.

The pile driver is of the self-contained, revolving, locomotive type, with the necessary mechanism for performing by diesel power the operations of hoisting, rotating, traveling and operating the pile-hammer leads. It is powered by a package unit, consisting of a 300-hp General Motors diesel engine and a fluid torque converter, which is capable of propelling the driver at speeds up to 24 mph on a level track and can negotiate alone a 5-per cent grade. On straight level track the driver can pull 10 loaded cars weighing 70 tons and one such car on a 4-per cent grade.

This means of propulsion is advantageous where a driver frequently will be called upon to repair the ravages of flash floods. The Santa Fe's experience is that while bridges damaged or washed out by one flood are being repaired a second frequently occurs. In such a case, a driver propelled by a diesel-electric transmission might not be able to extricate itself, whereas the mechanical transmission will function in two or three feet of water.

Leads Hydraulically Controlled

The pile driver has 60-ft leads which permit placing 50-ft piles under the hammer and still clearing the

LEADS are tilted by a hydraulic ram to give the piles forward batter in 1-in. increments up to 3 in. in 12. Other hydraulic rams tilt the leads laterally to provide side batter up to 2½ in. in 12.

top of the rails. The leads are raised and lowered by a hydraulic ram instead of the conventional cables. This ram also tilts the leads to provide a forward batter; other hydraulic rams tilt the leads laterally to provide side batter. The leads can be firmly locked in any of these batter positions. Power for the hydraulic pumps comes from the diesel engine.

The Vulcan 50C hammer is of sufficient size to drive steel sheet piling, timber piles, H-beam piles and concrete piles, but the road has provided in the spread of the lead guides to permit use of a Vulcan 80C pile hammer for driving 24-in. concrete piles.

Equipped with Earthborer

In working position the leads will drive piles 22 ft ahead of the leading car axle. The leads have a pile-and-hammer capacity of 25,000 lb at full working radius, but this can be increased to 35,000 lb when the outriggers of the carbody are extended and properly set. The leads are constructed of steel shapes and plates welded together and rigidly held by U-shaped yokes spaced 8 ft apart.

Each outfit has also been equipped with a Ka-Mo earthboring machine. This unit is for use where hardpan is encountered near the ground surface and where driving may develop little penetration or induce brooming of the pile. It can also be used to dig holes for piles longer than 50 ft. The machine is held in position by the leads but works in front of them.

Jetting of piles in place sometimes becomes necessary, and the driver is fitted with jetting equipment. This includes hose and pipe connections and a Jaeger pressure pump.

All controls are air-operated. A 2-in. pipe line across the side of the driver carbody carries air from the compressor car to the pile hammer. To prevent the hoses from dragging on the ground, another pipe was fastened half-way up the leads, and short connections made between this pipe and the hammer.

Train-line control and additional air supply for the air brakes are also provided in the cab. This arrangement makes it possible to apply the brakes in a train of cars being hauled by the driver.

A 2.5-kw generating plant in the cab furnishes current for lights.

Auxiliary Cars

The idler car is a flat car over which a portion of the leads will project while lowered for traveling. At one end of the car a small building houses a jet pump and the earthboring machine, as well as some of the small tools and equipment.

The compressor car contains two 600-cfm Gardner-Denver diesel-engine-driven compressors and a 5-kw generator. The electric generator supplies the energy where electric power tools are used and also for floodlights.

Railroading

After Hours

Flowe· Boxes in Minot

I was in Minot, N. D., on October 12 for the opening of the Great Northern's new Gavin yard—a big day for Minot and a big day for the GN. All around the passenger station I noted as attractive a display of window box flowers as I've ever seen anywhere. It's no small accomplishment to select the kind of flowers which will bloom profusely in North Dakota in mid-October. I asked the ticket agent who took care of the boxes, and he told me a m. of w. employee had the assignment.

There doesn't seem to be any uniformity on the railroads—about who takes care of the station flowers, if any. Sometimes it's the railroad. Sometimes it's an employee—on his own time. Sometimes it's the local garden club. Fresh paint, cleanliness, and flowers—they all go together. They are not, relatively, expensive; and it's hard to find a good reason why they're not standard practice everywhere.

Recruiting H.S. Grads

I got to talking at Minot with C. A. Pearson, who heads the GN's personnel operation. I had heard of the

by James G. Lyne

Editor, Railway Age

program (in which the GN and several other railroads are participants), whereby college teachers, usually of economics, spend several weeks on a railroad each summer. They are given a good look into all major departments, with the objective of enabling them to carry back to their classes some practical knowledge of industry operation.

This past summer the GN arranged for a vocational director from the St. Paul public school system, also, to take this get-acquainted course in railroading. As a result, this educator became aware of a great many places on the railroad where—in his opinion—there are attractive employment opportunities for alert high school graduates.

There is, actually, just as much inter-industry competition for alert employees among high school graduates as among college graduates—and railroad employment's attractions aren't publicized as much as those of some of the newer industries.

I'd guess it would be quite an advantage to have vocational counselors as familiar as possible with attractive job opportunities on the railroads.

Who Started Big Lettering?

One of the most noticeable developments in railroading in the past couple of years is the trend to jumbo-sized lettering of railroad names or initials on freight cars. I have been asking around to see who should get the credit for starting this trend—and I gather that the Soo Line has a pretty good claim to the distinction. But they did it a long time before the trend began.

Anyhow, the big lettering seems all to the good—not only for operating reasons, but for advertising, making every car a moving billboard. And if ownership is going to be so conspicuously displayed, quite likely there will be an added, though subtle, incentive to keep the cars in good shape and appearance, generally.

TICKET SELLERS AREN'T ENOUGH . . .

Incentives Make Salesmen

- The railroads have "a selling potential that any sales director in American industry would consider a priceless possession."
- What is that asset? It is 22,000 retail salesmen in 4,400 exclusive outlets.
- How can it be put to work? By giving these natural outlets incentives to get out and sell.

. . . So concludes the report of a joint Pullman-Railroad committee on a sales incentive program presented at the annual meeting of the American Association of Passenger Traffic Officers in Miami Beach, October 10-12. Put otherwise in the report: "With the proper application of up-to-date sales planning, both the American railroads and the Pullman Company can increase their passenger revenue by millions of dollars a year without adding any additional equipment, or increasing operating costs beyond incidental expenses."

"All That Counts Is Selling"

If the railroads don't have more passenger business "it is because you don't deserve it; I marvel that you get as much business as you do." So commented Hays MacFarland, chairman of the board of MacFarland, Aveyard & Co., Chicago advertising agency which helped steer the sales incentive test for Pullman.

"The most amazing thing in the railroad industry is that you have now, at hand, the most magnificent potential machinery of distribution of any industry I can think of—22,000 exclusive sales outlets in your ticket sellers. The local station agent in the kind of small towns I grew up in is a pretty important man; yet it just never seems to have occurred to executives that they *might* make a salesman of him."

Charged Mr. MacFarland, ticket sellers are "reluctant purveyors of tickets—and I don't blame them a damned bit. But they are ambulatory; they can walk and call on their friends and neighbors and the community and re-sell the public on railroad transportation.

"Today in America all that counts in business is *selling*. What the railroads need is a Billy Graham."

Practical optimism—coupled with a feeling that the passenger business of the railroads is in a state of crisis—characterized most of the passenger officers' sessions. The keynote, sounded by C. McD. Davis, president of the Atlantic Coast Line, was satisfaction that "the industry is taking a good, long, strong look at the passenger business"—plus optimism about the future of long-haul travel, and vacation trade in particular. The railroads made such an appraisal in the middle of the depression and came through with many important developments—like the streamliner—that gave rebirth to the business. The Coast Line, he declared, "is going to stay in the business—and I mean *stay* in a big way." The two most important things for the railroads to do now are to (1) reduce time of trains in transit and (2) improve the comfort of the ride, with emphasis on refinement of roadbed as well as rolling stock.

Optimism for the future of rail travel was found by Joseph J. Stedem, executive vice-president of Hertz System, Inc., to lie in the fact that the auto rental business is enjoying an increasing rate of growth. One out of five Hertz customers comes by rail. In 1956 to date, car rentals are up more than 35% over last year; in 1955 they were up 30% over 1954, and in 1954 up 25% compared with 1953. In 1947 Hertz operated 2,600 autos in 200 cities. Today they have 20,000 in 800 cities.

Integration of Military Transport

The first phase of consolidating traffic procurement functions of the armed forces went into effect on October 1, when headquarters of the Military Traffic Management Agency opened for business in Washington. The second phase, opening of five regional offices, is targeted for April 1, 1957, and the third and final step, staffing of individual military installations, is due by June 30, 1957.

So reported Brig. Gen. E. C. R. Lasher, executive director for traffic management of MTMA, who told the passenger men that integration will effect a cut of 20 to 25% in personnel required to staff the transportation function of the armed services

—with a direct payroll saving of $1.1 million a year. Just under 1,000 will be required to man the new consolidated operation—10% military, the rest, civilian. Whereas transportation companies have had to reckon heretofore with four separate sets of regulations—Army, Navy, Air Force and Marine—effective about November 1 unified regulations will go into effect. MTMA will have the right to go direct to any element of the four services for technical direction on traffic matters. Routing of group travel (15 men or more) will be vested in the Washington headquarters.

Better Than Expected

The job — described by Gen. Lasher as "like putting together the traffic departments of General Motors, Ford and Chrysler"—is going better than expected, for despite deeply-rooted service loyalties, "people on the working level are responding to their common training as traffic and transportation men."

The report of the joint Pullman-Railroad Committee, introduced by Pullman's president, C. R. Harding, was presented in detail by Walter C. Power and George W. Stokes, vice-presidents of the MacFarland agency. Objectives of the intensified selling plan are to:

1. Upgrade accommodations at the ticket windows and reservation desks—move coach passengers up to Pullman and switch Pullman travelers from less costly to more expensive accommodations.

2. Expose more people to the comforts of the variety of Pullman accommodations available.

3. Encourage the outside solicitation of business for all passenger traffic.

An incentive program was put under test for a two-months' period at each of nine cities on three railroads selected for being "typical" in terms of population, average family income and automobile saturation:

On the Burlington—Quincy, Ill. (pop. 46,900); Burlington, Iowa (32,200); and Casper, Wyo. (32,900).

On the Missouri Pacific—Jefferson City, Mo. (30,000); Little Rock, Ark. (117,500); and Sedalia, Mo. (22,800).

On the Union Pacific—Riverside, Cal. (69,500); Boise, Ida. (41,000); and at Cheyenne, Wyo. (37,800).

Two or three days before the starting date of each test, representatives of the joint committee went to the test city and covered the procedure in detail with local personnel—usually at a dinner for the participants and their wives. Here were given simple suggestions—such as reading local newspapers for leads on convention trips. "As the tests went on, the committee found that some of the ticket salesmen were able to develop methods for creating business which were often far more effective than any suggestions we could give them," adds the report. The committee stayed in town only long enough to see that the program was under way, then departed, leaving matters entirely in the hands of local sellers and supervisors. At completion of the test, a follow-up visit obtained salesmen's reactions.

Ticket-selling forces in each of the nine test cities were given a 60-day "quota of normal business" based on the previous year's revenues—corrected for trend up or down already in evidence before the test and for rate changes. This quota—held fair by all sellers—was assigned as a minimum goal for the entire selling group in the city, combining, where they existed, depot and city offices into one team. Thus each ticket outlet received a bulk award, to be distributed in shares among the individual employees on a basis which they themselves decided. In no instance did the local group fail to arrive at a workable plan.

Award System

The goal was new sales. Forces were given a small award for reaching their quota—on the theory that, since the average national decline of 5% in revenue was expected—halting the decline should be recompensed to some degree. Then, for each dollar of Pullman space sales *over* the quota, the office group was entitled to a bulk award equal to 20 cents. All awards were in terms of merchandise, offered from a catalog.

Combining test periods of 60 days each, variously between March and August 1956, it was shown that, as a result of the incentive plan, local ticket sellers produced more than $19,000 in additional space revenue, or 31.4% over quota. In addition, for which they were not remunerated, they sold almost $16,000 additional first class railroad revenues. At the same time, these incentive sales did not rob coach revenue, which went up during the test period.

Total cost of merchandise awards made to the selling groups was $4.4 thousand. This was less than 13% of the total *increase* in Pullman and first class revenues thus produced.

Continuous Operation

Says the report: The test results indicate that if this incentive plan were put into effect on a national basis, the railroads and Pullman could look forward to a net increase in gross passenger revenues of up to $43 million a year. Such a plan could be put into actual operation within 150 days after a decision is reached to proceed—including 60 days for the railroads to indoctrinate and train ticket salesmen. The plan would operate continuously, 12 months a year. Individual quota periods would be three months, with prize points awarded at the end of each quarter. Award points would be mailed to each location; they could be used as received, or accumulated to secure higher point merchandise. Pullman would prepare all promotional and sales training material.

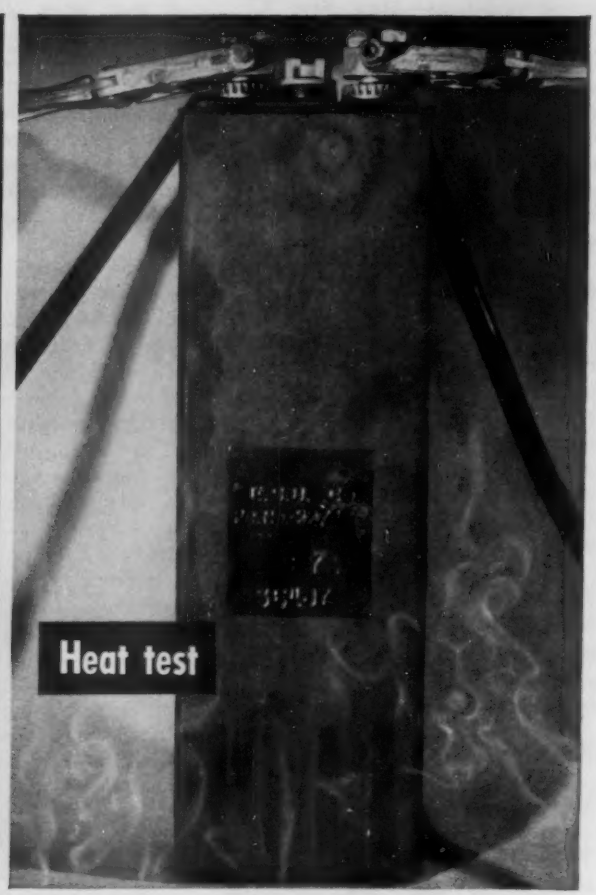
AAPTO voted to send the program for consideration to the territorial passenger associations. Earl B. Padrick, chairman of the Interterritorial Passenger Association, urged consideration of a similar incentive program to tie in with increased first class and coach railroad revenues as well.

The joint Pullman-Railroad Committee which carried out and reported on the tests included J. J. Alms, R. J. McDermott and E. A. Klippel, general passenger traffic managers of the Burlington, MP and UP, respectively, and J. J. Nolan, vice-president — traffic, and R. C. Buckingham, passenger traffic manager, of the Pullman Company.

Presiding over the AAPTO sessions was Retiring President James B. Sharpton, general passenger traffic manager, ACL. Newly elected president is James N. Findlay, passenger traffic manager. Furness, Withy & Co., vice-president, R. T. Anderson, general passenger traffic manager, Santa Fe; and re-elected secretary-treasurer, Ben D. Branch.

EXIDE-IRONCLAD BATTERIES

For railway car lighting and air conditioning



Deliver the power over a wide range of temperatures

BATTERY FOR RAILWAY CAR LIGHTING AND AIR CONDITIONING. Model EHL. Write for Bulletin No. 5168.

At few places on earth do storage batteries ever encounter such extremes of cold and heat as are used to test Exide-Ironclad Batteries in the laboratory.

These tests prove that Exide-Ironclad Batteries can be depended upon over a wider range of temperatures than they are ever likely to be asked to endure. And they provide tangible extra assurance of dependability at all the more normal operating temperatures.

Extreme temperature performance is especially important when a battery must have continuous dependability. It is often at these extremes that a battery is most needed. And a battery cannot be called dependable unless it can be counted on every day—all of the time.

The high and low temperature performance of Exide-Ironclad Batteries is a direct result of their unique construction features and special engineering. In countless applications, these batteries have earned an unmatched reputation for long life and high capacity. When you need batteries for heavy duty uses, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

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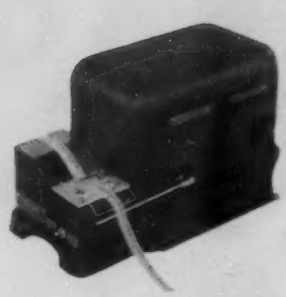
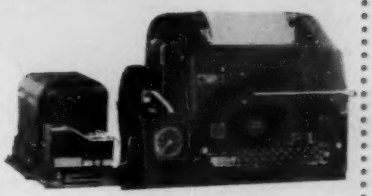


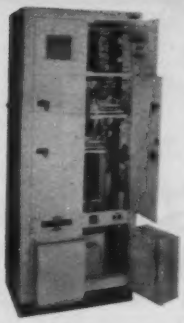
TAPE TRANSMITTER DISTRIBUTOR

TYPING REPERFORATOR

Send-Receive Printer, Tape Transmitter Distributor, Keyboard Tape Perforator

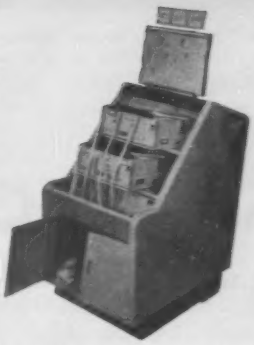


COMPOSITE SET



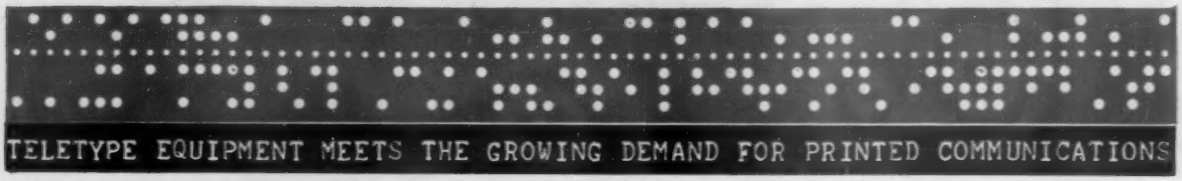
Receiver Cabinet

"TORN-TAPE" RELAY EQUIPMENT



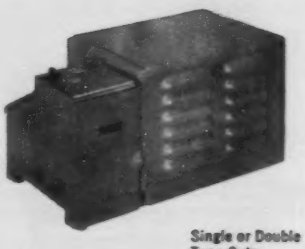
Transmitter Cabinet

"TORN-TAPE" RELAY EQUIPMENT



60 Characters per Second

HIGH SPEED TAPE PUNCH



Single or Double Tape Gate

HIGH SPEED TAPE READER

A new issue of the booklet "The ABC's of TELETYPE Equipment" is available upon request. Write to:
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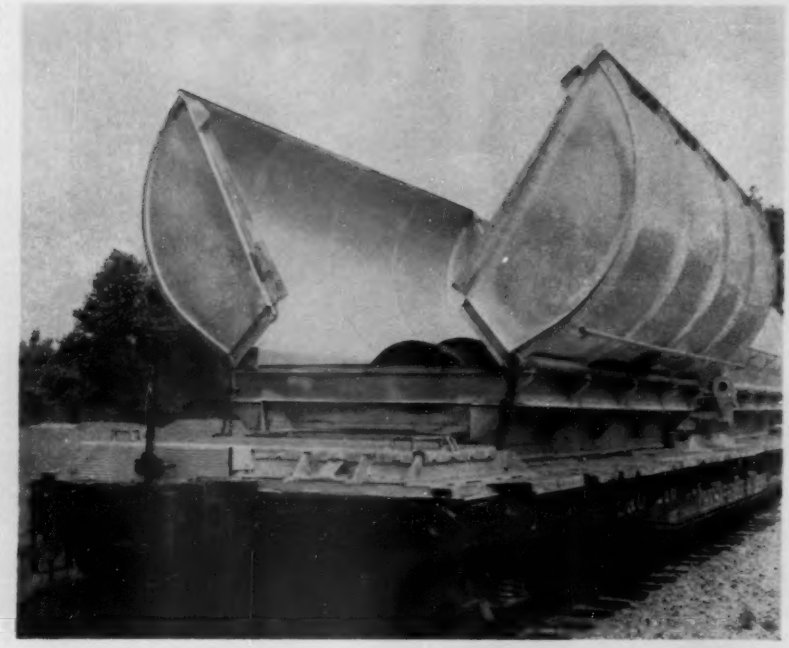
COIL SHEET STEEL is locked firmly in place by adjustable cross members.



TURN CRANK with worm gear enenables the car to be opened and closed. Weathertight "cocoon" has adjustable cross members which lock lading in place.

"Cocoon" Car Cuts Costs

Aimed at bringing coil steel traffic back to the rails, this specialized "cocoon" car trims the shipper's packaging costs and protects lading from weather and shock. Designed by Evans Products Company of Plymouth, Mich., the "cocoon" loader can be mounted on a standard 70-ton flat car. It will cost about $3,700 per flat car.

A test car has been in service between Pittsburgh and Detroit for 10 weeks.

Construction of in the neighborhood of 100 more cars for lease or sale is under consideration by Evans through a subsidiary, Greenville-Evans.

The test car has received endorsements from both the producers of coil steel and the large consumers, a spokesman for Evans Products told Railway Age. Savings to the shipper are substantial, according to the manufacturer.

Packaging costs—including skids, wrapping, dunnage and labor——are cut to a minimum when the coil steel load container is used.

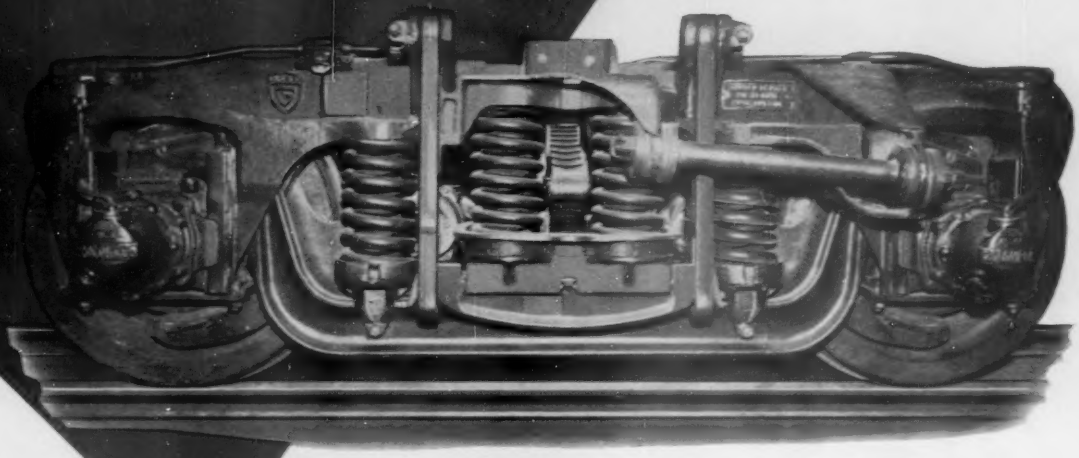
These savings, coupled with the loader's shock protecting action, have opened the way for the railroads to regain competitive coil steel traffic now handled by highway, Evans believes.

This coil steel container is reported to have several important advantages over hood type cars currently under test in the same type service. First, the lading covers are permanently attached to the unit, thus eliminating any need for storing the lading cover on the shipper's loading dock. Second, the unit provides protection against longitudinal shock. (Test indicated no damage to lading after a coupling shock of 12 mph.) Third, the car does not require adjustment before it is loaded. The adjustable cross members lock each roll of steel in place.

LOAD IS PROTECTED from longitudinal shock by coil spring shock absorbers mounted to the flat car's deck (Arrow No. 1).

Progress in lightweight equipment!

Built by The Budd Company



The New P.R.R. "Keystone" Rides Smoothly, Safely on

COMMONWEALTH 4-WHEEL TRUCKS

The revolutionary Pennsylvania "Keystone" train features Commonwealth *4-wheel* trucks with outside spring suspension and large central bearings on all cars. Designed to meet the requirements of this lightweight equipment, the trucks have a shorter wheelbase and are lighter in weight, but maintain *all* the advantages and proven principles of the modern standard 4-wheel truck.

The one-piece cast steel truck frame provides great strength and safety with minimum weight. Outside spring suspension assures better, more comfortable riding at all speeds and provides a wider spring base thereby reducing car body roll. Inspection and maintenance are simplified. Central bearings control truck shimmy and increase mileage between wheel turnings.

Whatever your requirements, in conventional or lightweight equipment, equip your cars with Commonwealth 4-wheel trucks for the utmost in passenger comfort and substantially lower maintenance expense.

GENERAL STEEL CASTINGS

GEARED TO PROGRESS
P I R I
MEMBER

GRANITE CITY, ILL. EDDYSTONE, PA.

Wire photograph of Georgi Malenkov in one of his happier moods

"Thank you, America, for what you're doing to your railroads!"

We're not alarmists, but the current plight of America's railroads must give quite a chuckle to the men in the Kremlin.

Our railroads, after all, are our first line of transportation defense. ***In World War II they carried 90% of all military supplies, and carried 95% of all military personnel.***

And right now the railroads are having a rough time handling present demands—to say nothing of what they'd be up against in a national emergency.

At this very moment the nation is suffering from a shortage of over 100,000 freight cars.

You may not realize it, but the situation is so serious that our farmers and other producers can't get their products to market. Boats have been tied up in harbors for days on end, waiting for freight cars to unload their cargo.

What would happen if the Suez crisis suddenly burst into flame? What would happen if the Reds suddenly struck somewhere else?

It's not a pleasant thought. The bald truth is that our railroads are being starved to death through political regulation. They lost over a half *billion* dollars last year on their passenger business alone. They are fighting for their lives in the face of *subsidized* competition from highly prosperous users of airways, waterways and highways. They are being hit right and left by murderous and discriminatory taxes.

The Central's answer: 17,000 new freight cars

In spite of all these handicaps, the Central has ordered more than 17,000 new freight cars, at a cost of over $178,000,000. That's right—over seventeen *thousand* freight cars—enough to make a train that would stretch almost from New York to Washington.

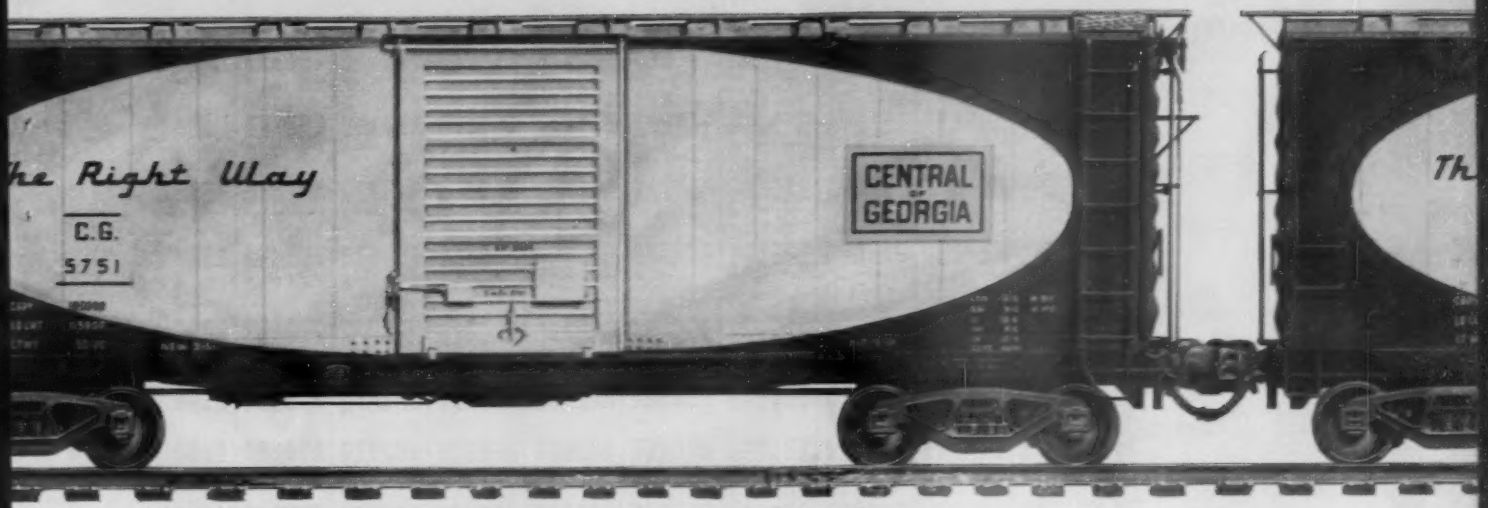
You can bet they'll be a big help. But this is only the beginning of what we want to do and *would* do if we were allowed to stem our losses and run our business the American way instead of the Russian way. (The Russian way is without profit.)

Not until the railroads are allowed to make a fair return—just like America's retail stores, coal operators, manufacturers and public utilities—can we be expected to replace our worn-cut equipment. (*More than one-third of U. S. freight cars are over 25 years old . . . and more than two-thirds of U. S. passenger cars are over 25 years old!*)

Not until the railroads are allowed to make a fair return can we give the nation the truly modern railroad service that present-day technology makes possible.

And, far more importantly, not until then can our railroads be ready to meet any crisis that the Kremlin could precipitate.

New York Central Railroad



...and the RIGHT WAY to specify running gear

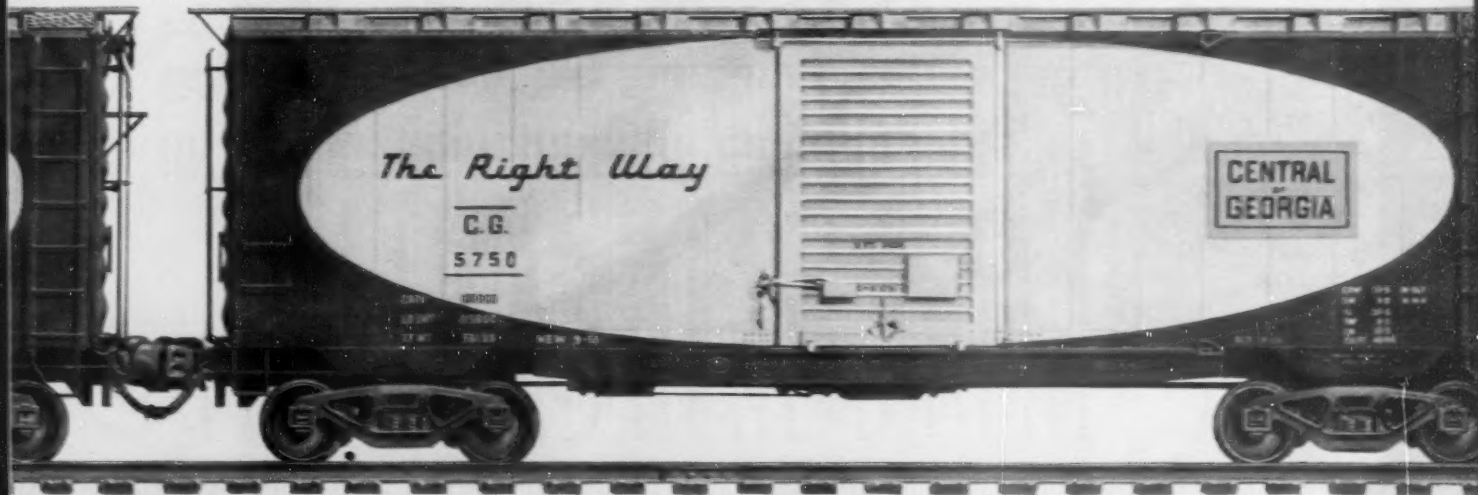
These new Central of Georgia box cars—featuring an outstanding aluminum oval design—are now working to help this progressive railroad serve the Southeast and the nation.

The Central of Georgia is one of many railroads that look to the *manufacturing experience* and *quality of workmanship* of their suppliers for the type of equipment that leads to *continuous* good service. It is this confidence that led to the specification of ASF coupler yokes, side frames and bolsters for many of these cars.

Here's another example of railroads and their suppliers *working together*—to make freight service a bigger value than ever before.

ASF

AMERICAN STEEL FOUNDRIES
Prudential Plaza, Chicago 1, Illinois
Canadian Sales: International Equipment Co., Ltd., Montreal 1, Quebec



REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1956	1955	Operating Expenses: Maint. Way and Structures: Total 1956	1955	Depr. and Retirements	Maint. Equipment: Total 1956	1955	Depr. and Retirements	Traffic	Transportation	Total 1956	1955	Operating ratio 1956	1955	Net from railway operation	Railway tax accruals	Net railway operating income 1956	1955
Akron, Canton & Youngstown	August	171	$483	....	$496	$499	$77	$71	$6	$63	$59	$14	$41	$151	$375	$355	75.7	71.2	$121	$57	$40	$43
	8 mos.	171	3,857	....	3,948	3,962	577	552	45	508	470	109	339	1,211	2,996	2,786	75.9	70.3	952	448	282	402
Atchison, Topeka & Santa Fe	August	13,124	39,276	$4,912	48,951	50,156	7,196	8,012	822	9,534	9,216	2,131	1,190	17,104	37,504	36,666	76.6	73.1	11,447	6,210	5,661	6,424
	8 mos.	13,124	328,076	30,227	392,879	380,927	58,289	52,128	5,686	76,361	70,585	16,437	10,331	132,086	295,546	270,909	75.2	71.1	97,333	51,809	44,111	48,554
Atlanta & St. Andrews Bay	August	82	389	....	393	340	55	31	3	51	22	7	6	73	204	147	52.0	43.2	189	80	67	70
	8 mos.	82	2,902	5	2,954	2,767	358	290	22	250	223	54	55	585	1,399	1,252	47.4	45.2	1,555	690	589	557
Atlanta & West Point	August	93	238	30	323	330	44	35	6	58	62	13	16	147	288	272	89.2	82.5	35	21	5	24
	8 mos.	93	1,962	244	2,664	2,065	369	299	51	516	426	105	138	1,176	2,378	1,868	89.3	90.4	286	169	—22	—54
Western of Alabama	August	133	264	30	331	345	23	59	8	63	68	18	18	135	261	292	78.9	84.7	70	49	44	41
	8 mos.	133	2,230	236	2,767	2,195	377	360	61	563	489	145	150	1,097	2,359	1,984	85.3	90.4	408	271	239	118
Atlantic Coast Line	August	5,292	10,245	1,375	12,573	11,909	2,456	2,608	174	3,270	2,637	614	409	5,238	12,009	10,969	95.5	92.1	564	....	549	933
	8 mos.	5,289	92,180	12,638	113,925	106,798	20,376	19,073	1,291	24,359	22,973	4,840	3,476	43,651	97,067	89,600	85.2	83.9	16,859	8,000	6,343	7,748
Charleston & Western Carolina	August	343	546	....	558	565	132	128	—1	112	104	42	19	166	444	421	79.7	74.5	113	65	77	115
	8 mos.	343	4,995	....	5,078	4,178	1,203	1,075	124	887	852	338	160	1,432	3,811	3,388	75.0	81.1	1,268	660	634	458
Baltimore & Ohio	August	6,020	34,569	1,700	38,906	38,473	3,903	4,873	473	6,871	6,838	1,065	950	16,129	29,756	31,625	76.5	82.2	9,150	3,309	4,433	3,417
	8 mos.	6,020	274,746	12,873	307,364	280,024	33,648	33,306	3,980	65,636	55,467	8,324	7,873	127,148	249,686	222,026	81.2	79.3	57,678	20,016	26,733	27,676
Staten Island Rapid Transit	August	29	195	61	258	262	46	46	12	29	25	2	2	142	251	243	97.1	92.8	7	42	—55	—41
	8 mos.	29	1,529	473	2,031	1,986	404	353	94	234	197	14	14	1,117	2,030	1,891	100.0	95.3	1	330	—536	—405
Bangor & Aroostook	August	602	951	30	1,023	928	211	200	17	260	305	103	25	317	923	869	90.3	93.7	100	107	253	215
	8 mos.	602	10,976	225	11,586	9,230	2,364	2,100	132	2,021	1,954	814	221	3,012	8,210	7,243	70.9	78.5	3,375	1,494	2,735	1,920
Bessemer & Lake Erie	August	208	1,783	1	1,804	2,893	215	194	18	522	581	141	33	374	1,231	1,411	68.2	48.8	574	474	498	905
	8 mos.	208	15,526	3	15,761	16,882	2,211	1,390	341	6,446	4,512	1,116	240	3,532	13,231	10,316	84.0	61.1	2,530	2,570	3,051	4,671
Boston & Maine	August	1,573	5,397	1,021	7,225	7,413	906	997	153	958	839	230	130	3,152	5,538	5,370	76.7	72.4	1,687	577	667	789
	8 mos.	1,573	45,280	7,067	58,828	56,481	8,118	8,036	1,180	7,582	7,192	1,713	1,137	26,670	46,824	43,058	79.6	76.2	12,004	4,072	3,454	4,162
Canadian Pacific Lines in Maine	August	234	310	57	399	404	132	102	13	68	71	17	9	189	413	382	103.5	94.6	—14	30	—65	—53
	8 mos.	234	4,638	357	5,215	4,837	978	838	141	1,004	935	139	67	2,070	4,244	3,978	81.4	82.2	972	257	223	302
Carolina & Northwestern	August	284	343	....	348	318	68	64	7	18	16	7	4	79	183	174	52.6	54.5	165	36	82	72
	8 mos.	284	2,567	....	2,614	2,185	520	518	53	144	129	56	34	635	1,434	1,342	54.9	61.4	1,180	262	521	344
Central of Georgia	August	1,764	3,239	175	3,677	3,479	610	618	56	670	603	159	173	1,423	3,070	2,892	83.5	83.1	606	249	332	289
	8 mos.	1,764	26,376	1,295	29,895	28,496	4,629	4,543	372	4,756	4,735	1,229	1,384	11,414	23,762	22,733	79.5	79.8	6,133	1,966	3,685	3,394
Central of New Jersey	August	612	4,546	513	5,460	4,826	818	801	227	879	807	178	78	2,241	4,231	3,956	77.5	82.0	1,229	580	449	318
	8 mos.	612	34,015	3,953	40,775	37,584	5,302	5,005	898	7,202	6,542	1,392	605	17,414	32,268	29,439	79.1	78.3	8,507	4,118	2,844	3,134
Central Vermont	August	397	833	88	989	782	234	277	17	97	98	10	18	401	789	759	79.8	97.1	200	51	36	—140
	8 mos.	397	6,534	522	7,859	7,240	1,577	1,523	129	900	833	87	142	3,177	6,098	5,590	77.6	77.3	1,761	393	469	391
Chesapeake & Ohio	August	5,132	35,028	659	38,123	35,099	4,168	4,036	413	5,527	5,779	1,631	761	11,613	23,606	22,314	61.9	63.6	14,517	7,655	7,266	6,267
	8 mos.	5,132	254,375	4,843	273,577	244,068	30,732	28,837	3,204	45,525	41,584	12,361	6,180	90,155	184,496	163,480	67.4	67.0	89,081	43,554	49,202	45,075
Chicago & Eastern Illinois	August	868	2,636	259	3,142	3,010	381	388	26	525	488	137	143	1,175	2,424	2,350	77.1	78.1	718	206	331	368
	8 mos.	868	21,050	1,797	24,708	22,542	2,915	2,940	236	3,930	3,842	1,074	1,094	9,441	18,936	17,967	76.6	79.7	5,772	1,826	2,729	2,606
Chicago & Illinois Midland	August	121	647	....	662	659	76	79	7	117	115	24	30	148	414	446	62.5	67.7	249	131	110	83
	8 mos.	126	5,105	....	5,231	5,078	437	550	81	803	936	194	246	1,233	3,085	3,545	59.0	69.8	2,146	1,128	980	572
Chicago & North Western	August	7,825	13,906	1,621	17,219	18,916	2,642	2,653	287	2,498	2,838	897	381	7,492	13,924	14,652	80.8	77.4	3,295	1,151	1,353	2,082
	8 mos.	7,833	102,832	11,701	127,613	129,376	21,591	20,051	2,532	25,733	22,909	7,072	3,059	60,476	117,764	111,007	92.3	85.8	9,849	9,448	—5,118	3,735
Chicago, Burlington & Quincy	August	8,806	18,755	2,063	23,140	23,356	3,978	4,085	416	3,697	3,053	910	527	8,888	18,056	16,982	78.0	72.7	5,064	2,288	1,986	2,844
	8 mos.	8,806	135,897	13,421	166,847	160,608	24,828	25,330	3,571	28,219	26,588	7,212	4,448	66,835	131,673	125,442	78.9	78.1	35,175	18,493	15,193	16,005
Chicago Great Western	August	1,470	2,979	36	3,168	2,926	451	451	39	499	427	125	125	984	2,160	1,957	68.2	66.9	1,008	433	404	375
	8 mos.	1,470	22,064	158	23,480	22,547	3,504	3,466	328	3,772	3,512	979	943	7,192	16,044	15,144	68.3	67.8	7,436	2,998	2,959	2,802
Chicago, Mil., St. Paul & Pacific	August	10,641	19,697	1,957	24,098	23,069	3,953	4,338	420	3,629	4,337	944	472	8,953	18,209	18,170	75.6	78.8	5,888	1,648	3,422	2,607
	8 mos.	10,641	135,902	11,730	166,825	157,562	28,217	28,719	3,234	31,578	31,340	7,362	4,181	67,036	140,571	132,904	84.3	84.4	26,254	12,574	9,011	9,076
Chicago, Rock Island & Pacific	August	7,597	14,010	1,630	17,111	17,322	2,576	2,524	247	2,777	2,609	585	507	6,362	13,074	12,288	76.4	70.9	4,037	1,382	1,709	2,076
	8 mos.	7,597	110,657	11,757	133,897	126,961	18,090	17,307	1,958	22,340	20,723	4,628	4,217	50,304	102,026	94,908	76.2	74.8	31,872	12,187	13,575	13,274
Chic., St. Paul, Minn. & Omaha	August	1,616	2,604	181	3,012	3,218	439	464	36	352	391	78	66	1,296	2,294	2,423	76.2	75.3	718	183	163	269
	8 mos.	1,616	18,747	1,126	21,608	21,473	3,353	3,450	341	3,319	3,156	625	551	10,723	19,030	18,593	88.1	86.6	2,578	1,497	—1,362	—983
Clinchfield Railroad	August	293	2,141	....	2,153	1,865	228	266	20	376	354	86	54	466	1,187	1,108	55.1	59.4	967	245	902	788
	8 mos.	293	16,548	....	16,646	12,253	2,170	1,820	156	3,017	2,198	751	450	3,758	9,840	7,330	59.1	59.8	6,806	1,632	6,194	4,442
Colorado & Southern	August	718	1,011	102	1,253	1,345	254	408	18	199	174	42	33	502	1,065	1,189	85.0	88.4	188	163	7	42
	8 mos.	718	8,257	572	9,919	10,041	1,585	1,630	133	1,714	1,329	339	258	3,956	8,070	7,382	81.4	73.5	1,849	1,211	460	1,059
Ft. Worth & Denver	August	1,362	1,747	184	2,117	2,008	293	275	32	262	252	45	67	787	1,522	1,436	71.9	71.5	594	204	225	232
	8 mos.	1,362	11,615	1,243	14,281	14,310	2,195	2,707	270	2,225	2,072	358	538	5,646	11,490	11,273	80.5	78.8	2,791	744	989	1,240

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1956	Total (inc. misc.) 1955	Operating Expenses: Maint. Way and Structures: Total 1956	Total 1955	Deprec. and Retirements	Maint. Equipment: Total 1956	Total 1955	Deprec. and Retirements	Traffic	Transportation	Total 1956	Total 1955	Operating ratio 1956	Operating ratio 1955	Net from railway operation	Railway tax accruals	Net railway operating income 1956	Net railway operating income 1955
Colorado & Wyoming	August	40	113	....	201	362	16	23	1	27	27	11	2	94	153	176	76.1	48.5	48	15	8	84
	8 mos.	40	1,424	....	2,357	2,427	191	278	18	243	254	88	12	866	1,424	1,498	60.4	61.7	933	479	349	402
Delaware & Hudson	August	771	4,668	189	5,021	4,574	563	549	83	706	671	173	93	1,610	3,225	3,014	64.2	65.9	1,796	876	1,017	1,064
	8 mos.	790	35,361	1,258	37,795	34,210	4,228	4,105	471	5,592	5,874	1,388	760	12,711	25,379	24,192	67.2	70.7	12,415	5,997	7,078	6,399
Delaware, Lackawanna & Western	August	962	6,019	839	7,508	6,509	896	1,585	136	1,147	1,952	335	210	3,614	6,237	6,609	83.1	101.5	1,272	325	755	—759
	8 mos.	962	47,047	6,469	58,755	53,886	6,725	7,120	1,094	8,726	9,219	2,616	1,587	28,682	48,624	44,576	82.8	82.7	10,131	3,648	5,461	3,547
Denver & Rio Grande Western	August	2,155	6,806	342	7,395	7,060	955	769	116	997	946	288	221	2,112	4,611	4,305	62.4	61.0	2,784	1,475	1,344	1,387
	8 mos.	2,155	47,811	2,076	51,578	49,610	6,504	5,851	785	7,720	7,454	2,245	1,701	15,705	34,091	31,852	66.1	64.2	17,486	8,604	9,282	9,209
Detroit & Toledo Shore Line	August	50	574	....	627	684	79	89	3	74	64	21	19	214	403	387	64.3	56.5	224	69	51	89
	8 mos.	50	5,147	....	5,565	5,602	654	666	29	546	523	167	148	1,754	3,239	3,065	58.2	54.7	2,326	818	590	709
Detroit, Toledo & Ironton	August	464	1,298	....	1,370	1,672	176	306	25	389	369	92	51	397	1,094	1,234	79.8	73.8	277	Cr. 96	363	371
	8 mos.	464	13,017	....	13,564	13,744	2,137	2,154	252	2,816	2,154	732	434	3,533	9,552	8,594	70.4	62.5	4,012	1,430	2,367	3,072
Duluth, Missabe & Iron Range	August	569	2,849	2	3,158	7,784	450	465	124	467	636	135	13	1,194	2,291	3,079	72.5	39.6	868	468	402	2,045
	8 mos.	569	21,325	7	24,730	33,533	3,497	3,094	760	4,977	4,444	1,054	85	9,063	18,836	18,073	76.2	53.9	5,894	3,532	2,292	6,899
Duluth, South Shore & Atlantic	August	544	702	5	753	668	157	166	11	122	119	25	32	249	582	587	77.4	87.9	170	45	100	24
	8 mos.	546	5,201	31	5,494	5,094	1,090	1,096	81	1,036	1,033	194	239	1,838	4,397	4,193	80.0	82.3	1,097	295	653	498
Duluth, Winnipeg & Pacific	August	175	523	2	532	545	72	84	4	75	78	2	6	253	415	393	78.0	72.2	117	40	—1	40
	8 mos.	175	4,537	7	4,592	3,905	611	525	35	615	552	17	49	2,026	3,370	2,902	73.4	74.3	1,222	363	180	115
Elgin, Joliet & Eastern	August	236	3,354	....	4,082	4,272	204	250	28	728	531	111	40	1,447	2,637	2,480	64.6	58.1	1,445	663	457	634
	8 mos.	236	28,261	....	34,336	32,722	2,090	1,891	231	6,465	4,254	870	294	12,693	23,175	19,173	67.5	58.6	11,160	5,000	2,877	4,660
Erie Railroad	August	2,207	12,858	655	14,700	13,888	2,039	2,088	217	2,207	2,042	522	379	6,529	11,888	11,563	80.9	83.3	2,812	1,067	1,111	985
	8 mos.	2,223	101,567	4,804	114,791	104,747	14,242	13,355	1,756	17,395	16,689	4,126	3,104	50,837	91,450	83,857	79.7	80.1	23,342	8,435	9,337	8,659
Florida East Coast	August	571	1,942	400	2,564	2,027	289	294	44	381	389	99	81	967	1,867	1,696	72.8	83.7	697	209	318	204
	8 mos.	571	19,399	4,255	25,884	23,662	3,337	3,040	365	4,409	3,999	794	676	9,304	19,064	17,367	73.6	73.4	6,821	1,684	3,091	3,036
Georgia Railroad	August	321	694	22	788	774	95	126	10	143	127	33	37	314	626	614	79.5	79.3	161	41	167	169
	8 mos.	321	5,167	141	5,989	4,518	997	827	67	1,142	896	262	305	2,494	5,235	4,211	87.4	93.2	754	328	730	355
Georgia & Florida	August	332	330	....	336	369	105	85	3	30	39	8	21	95	267	249	79.3	67.7	69	17	23	62
	8 mos.	332	2,380	....	2,427	2,311	740	615	28	293	251	65	165	707	2,043	1,772	84.2	76.7	384	154	66	219
Grand Trunk Western	August	951	4,490	256	5,108	5,246	768	725	125	983	752	94	87	2,542	4,599	4,078	90.0	77.7	509	383	—321	438
	8 mos.	951	37,062	1,871	42,148	41,128	5,548	4,764	546	7,670	5,932	752	697	20,589	36,188	30,916	85.9	75.2	5,960	3,004	—1,273	4,134
Great Northern	August	8,286	25,358	1,166	28,599	26,813	4,753	4,628	508	3,860	3,471	770	504	8,565	18,821	17,558	65.8	65.5	9,778	5,175	4,049	3,771
	8 mos.	8,285	160,491	7,201	179,404	170,631	35,568	33,268	3,022	31,643	26,784	6,036	3,945	61,035	139,791	126,664	77.9	74.2	39,613	19,893	16,302	17,629
Green Bay & Western	August	224	370	....	389	397	113	87	14	6	43	9	25	117	279	279	71.5	70.3	111	52	26	34
	8 mos.	224	2,901	....	2,987	2,975	705	543	44	326	306	73	187	905	2,274	2,010	76.2	68.0	713	336	154	278
Gulf, Mobile & Ohio	August	2,757	6,115	385	6,951	6,951	883	1,036	80	1,295	1,426	284	293	2,261	5,093	5,231	73.3	75.3	1,858	787	689	730
	8 mos.	2,757	48,707	2,650	55,048	55,208	8,175	8,385	615	10,561	10,457	2,371	2,320	17,707	41,700	40,243	75.8	72.9	13,347	5,586	4,756	6,546
Illinois Central	August	6,503	21,264	2,045	25,433	25,414	3,985	4,054	371	4,256	4,221	796	581	8,702	18,605	18,507	73.2	72.8	6,829	4,041	2,484	2,917
	8 mos.	6,524	161,785	14,582	194,808	191,527	29,990	28,790	3,332	33,139	31,500	6,334	4,663	70,040	146,486	139,502	75.2	72.8	48,320	25,962	17,982	20,372
Illinois Terminal	August	339	1,051	31	1,246	1,184	150	167	21	204	184	39	46	398	860	880	69.0	74.3	387	181	125	—145
	8 mos.	353	7,376	251	8,699	7,835	1,069	1,111	179	1,504	1,305	328	374	3,128	6,604	6,229	75.9	79.5	2,095	775	936	318
Kansas City Southern	August	891	3,726	126	4,202	3,903	389	415	54	489	506	95	95	1,170	2,280	2,258	54.3	57.9	1,922	876	778	673
	8 mos.	891	28,318	837	31,864	29,785	3,057	2,904	361	3,888	3,683	743	797	9,320	18,137	16,855	56.9	56.6	13,727	6,331	5,412	5,326
Kansas, Oklahoma & Gulf	August	327	350	....	350	395	95	44	7	32	26	11	44	87	282	221	80.4	55.9	69	33	11	82
	8 mos.	327	3,466	....	3,478	3,213	677	438	74	247	230	91	257	831	2,195	1,883	63.1	58.6	1,282	501	513	505
Lake Superior & Ishpeming	August	149	505	....	647	871	69	73	7	60	53	17	2	120	271	292	26.5	33.5	375	101	288	295
	8 mos.	149	2,358	....	2,964	3,578	453	447	56	561	485	137	17	707	1,872	1,795	63.1	50.2	1,092	517	716	993
Lehigh & Hudson River	August	96	274	....	275	225	35	39	2	36	28	8	16	105	203	180	74.0	80.0	71	30	11	7
	8 mos.	96	2,192	....	2,195	2,114	280	281	19	269	252	67	127	784	1,567	1,427	71.4	67.5	627	267	114	218
Lehigh & New England	August	178	791	....	799	605	94	96	6	199	176	44	21	233	595	546	74.5	90.2	204	46	291	61
	8 mos.	178	5,319	....	5,377	4,916	590	610	51	1,491	1,327	331	160	1,757	4,337	3,979	80.7	80.9	1,040	324	1,691	658
Lehigh Valley	August	1,147	5,590	268	6,152	5,709	791	1,212	103	988	978	153	153	2,744	4,918	5,114	79.9	89.6	1,234	465	740	88
	8 mos.	1,149	42,593	2,068	46,986	44,737	6,080	6,300	770	7,805	7,789	1,479	1,195	21,335	38,403	36,549	81.7	81.7	8,584	3,524	4,149	5,468
Litchfield & Madison	August	44	302	....	307	290	12	12	1	23	26	6	42	60	148	152	48.4	52.3	159	67	49	41
	8 mos.	44	2,538	....	2,572	2,305	93	101	6	195	203	45	338	503	1,280	1,224	49.7	53.1	1,292	540	401	360
Long Island	August	351	1,207	4,005	5,397	5,298	710	760	90	961	979	166	28	2,591	4,468	4,437	82.8	83.8	929	336	357	224
	8 mos.	351	9,411	31,988	42,758	40,482	6,133	5,406	888	8,599	7,641	1,302	208	21,175	37,382	34,249	87.4	84.6	5,376	2,721	681	1,346
Louisiana & Arkansas	August	746	2,358	60	2,530	2,506	285	264	43	341	301	98	76	698	1,488	1,354	58.8	54.0	1,042	447	500	546
	8 mos.	748	17,379	429	18,645	18,403	1,964	1,853	195	2,441	2,159	754	646	5,391	11,111	10,062	59.6	54.7	7,534	3,020	3,695	4,042

(More statistics on following page)

a RAILWAY AGE Workbook Page

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1956	Total (inc. misc.) 1955	Operating Expenses: Maint. Way and Structures: Total 1956	Total 1955	Deprec. and Retirements	Maint. Equipment: Total 1956	Total 1955	Deprec. and Retirements	Traffic	Transportation	Total 1956	Total 1955	Operating ratio 1956	Operating ratio 1955	Net from railway operations	Railway tax accruals	Net railway operating income 1956	Net railway operating income 1955
Louisville & Nashville	August	4,732	15,640	991	17,802	17,987	2,529	2,432	438	4,375	3,441	1,374	371	6,450	14,457	13,220	81.2	73.5	3,345	2,581	2,145	2,998
	8 mos.	4,732	122,770	6,873	139,382	109,276	19,670	15,650	2,175	29,903	24,075	7,238	3,028	51,869	110,185	87,195	79.1	79.8	29,198	20,233	18,265	17,225
Maine Central	August	944	1,956	140	2,247	2,104	466	456	30	378	330	79	21	796	1,763	1,631	78.4	77.5	484	243	211	183
	8 mos.	944	16,423	796	18,389	16,668	3,499	3,346	215	2,989	2,699	618	186	6,521	14,064	12,846	76.5	77.1	4,325	2,031	1,780	1,508
Minneapolis & St. Louis	August	1,397	1,767	6	1,840	2,171	215	263	29	234	273	78	94	660	1,326	1,386	72.1	63.8	514	216	213	310
	8 mos.	1,397	13,725	39	14,276	13,665	1,955	2,237	221	2,263	2,207	617	780	4,915	11,003	10,760	77.1	78.7	3,273	1,819	1,296	1,186
Minneapolis, Northfield & Southern	August	77	376	....	402	356	28	20	2	31	28	10	24	89	202	165	50.3	46.3	200	99	79	66
	8 mos.	77	2,783	....	2,963	2,827	177	318	16	268	224	84	195	661	1,531	1,474	51.7	52.1	1,432	712	573	528
Minn., St. Paul & S. Ste. Marie	August	3,224	4,704	86	5,027	4,085	1,048	759	40	649	691	121	93	1,497	3,463	2,977	68.9	72.9	1,564	762	558	493
	8 mos.	3,224	28,808	661	30,943	25,733	6,533	5,610	515	5,263	4,889	972	751	11,078	24,866	21,593	80.4	83.9	6,077	2,966	2,106	1,913
Missouri-Illinois	August	172	521	....	525	492	55	62	3	90	76	30	11	125	284	273	54.1	55.5	241	130	126	137
	8 mos.	172	3,754	....	3,781	3,811	498	472	31	670	605	242	87	930	2,257	2,193	59.7	57.5	1,525	839	822	985
Missouri-Kansas-Texas Lines	August	3,241	5,222	271	6,053	6,381	818	920	104	898	1,027	257	265	2,489	4,793	4,990	79.2	78.2	1,260	451	505	555
	8 mos.	3,241	43,088	1,885	49,341	48,728	6,961	6,857	804	7,839	7,285	2,053	2,190	19,760	39,371	37,521	79.8	77.0	9,970	3,597	3,493	4,416
Missouri Pacific	August	9,699	21,746	1,190	25,330	26,759	4,219	4,776	321	4,381	4,791	997	688	9,214	19,510	20,313	77.0	75.9	5,820	1,652	3,402	3,601
	8 mos.	9,700	176,681	8,095	202,750	197,880	31,559	33,419	2,686	35,250	36,230	8,002	5,357	74,085	154,127	152,773	76.0	77.2	48,624	15,524	26,212	25,502
Monon	August	541	1,666	62	1,876	1,907	247	281	19	309	289	73	98	721	1,492	1,461	79.5	76.6	384	150	130	175
	8 mos.	541	13,251	531	14,986	14,498	2,487	2,208	154	2,364	2,170	585	818	5,601	12,261	11,215	81.8	77.4	2,725	1,001	949	1,306
Monongahela	August	177	539	....	542	450	93	67	16	67	39	11	1	200	374	285	69.1	63.2	167	27	28	49
	8 mos.	177	4,165	....	4,199	3,787	582	499	133	469	448	92	6	1,467	2,609	2,371	62.3	62.6	1,581	146	500	309
Nashville, Chatt. & St. Louis	August	1,043	2,552	126	2,999	2,965	370	498	63	420	422	138	118	1,215	2,238	2,296	74.6	77.4	761	445	355	336
	8 mos.	1,043	20,478	1,022	23,991	18,016	3,884	3,177	400	3,486	3,091	1,109	980	9,442	18,760	15,488	78.2	86.0	5,232	2,852	2,273	1,249
New York Central	August	10,613	47,935	8,554	64,345	66,679	6,910	8,864	1,170	11,423	11,116	2,282	1,223	28,300	50,992	51,678	79.2	77.5	13,353	5,673	5,933	7,391
	8 mos.	10,613	390,220	66,927	518,053	497,553	55,853	59,885	9,241	90,244	83,505	18,032	9,643	235,061	418,062	392,255	80.7	78.8	99,992	44,247	40,336	48,021
Pittsburgh & Lake Erie	August	221	2,502	64	2,667	3,765	325	499	78	856	917	274	78	985	2,460	2,822	92.2	74.9	207	653	387	1,167
	8 mos.	221	24,749	499	26,741	27,514	3,390	3,312	598	7,242	6,695	2,165	605	9,661	22,605	21,070	84.5	76.6	4,137	6,450	6,069	8,611
New York, Chicago & St. Louis	August	2,178	13,993	175	14,723	14,441	1,604	1,513	146	2,392	2,152	397	334	5,398	10,207	9,445	69.3	65.4	4,516	1,979	1,908	2,140
	8 mos.	2,178	109,406	1,237	114,290	104,602	13,152	11,708	1,163	18,919	16,675	3,064	2,798	41,976	80,607	71,547	70.5	68.4	33,684	15,801	13,702	13,935
New York, New Haven & Hartford	August	1,769	7,272	4,586	13,480	12,814	1,645	1,037	263	1,863	1,896	290	210	5,987	10,612	10,147	78.7	79.2	2,868	998	512	852
	8 mos.	1,769	60,973	33,828	106,807	103,626	12,614	11,485	2,158	17,371	14,942	2,741	2,083	48,726	88,152	81,948	82.5	79.1	18,656	7,641	12	7,866
New York Connecting	August	21	253	....	283	329	108	135	25	12	21	....	....	71	194	246	68.5	74.9	89	94	11	—15
	8 mos.	21	2,708	....	2,938	2,962	812	768	203	100	165	....	....	694	1,635	1,698	55.6	57.3	1,303	761	502	522
New York, Ontario & Western	August	541	425	....	444	493	137	138	20	54	96	22	30	249	499	546	112.3	110.7	—55	42	—168	—171
	8 mos.	541	3,702	....	3,824	3,736	933	912	148	692	712	179	225	2,139	4,246	4,065	111.0	108.8	—422	340	—1,411	—1,253
New York, Susquehanna & Western	August	120	363	39	422	405	51	74	9	55	56	12	8	205	351	355	83.3	87.5	70	18	19	—27
	8 mos.	120	2,975	348	3,482	3,965	413	451	49	454	473	102	75	1,603	2,808	2,904	80.6	73.2	674	199	164	253
Norfolk & Western	August	2,132	20,343	355	21,694	19,264	2,742	2,113	301	3,950	3,920	809	375	5,852	13,708	12,098	63.2	62.8	7,986	4,724	4,166	3,691
	8 mos.	2,128	147,336	2,421	156,957	133,735	20,930	17,160	2,539	33,911	27,788	5,908	2,891	46,140	109,943	90,699	70.0	67.8	47,014	29,791	24,669	22,570
Norfolk Southern	August	604	886	....	901	868	193	200	14	133	123	30	49	271	702	681	77.9	78.4	199	102	59	58
	8 mos.	604	6,816	....	6,923	6,671	1,517	1,443	104	986	992	238	391	2,138	5,514	5,203	79.6	78.0	1,409	663	449	461
Northern Pacific	August	6,865	16,328	694	18,269	17,201	2,683	3,003	426	2,810	3,040	621	349	6,369	13,116	13,371	71.8	77.7	5,153	2,877	2,243	1,681
	8 mos.	6,865	109,811	4,851	123,334	117,509	18,373	17,295	2,412	22,834	21,071	4,677	3,062	48,833	100,065	93,965	81.1	80.0	23,269	13,592	10,692	11,615
Northwestern Pacific	August	329	1,337	6	1,364	1,770	115	310	18	124	111	4	8	424	694	907	50.9	51.2	669	306	192	283
	8 mos.	329	8,616	24	8,748	9,883	1,568	2,713	138	839	834	32	54	2,800	5,459	6,587	62.4	66.6	3,289	1,193	648	704
Pennsylvania	August	10,006	65,258	10,623	84,104	83,056	9,656	8,965	1,442	16,410	18,464	2,968	1,352	36,968	68,449	67,925	81.4	81.8	15,655	5,672	7,059	6,850
	8 mos.	10,006	508,384	82,886	654,840	609,638	70,487	65,857	11,387	132,517	128,374	22,952	11,097	291,945	538,398	496,840	82.2	81.5	116,442	46,491	45,852	51,238
Penn-Reading Seashore Lines	August	358	658	302	990	991	251	178	94	143	121	27	15	553	1,005	938	101.5	94.6	—15	85	—270	—175
	8 mos.	358	5,129	1,222	6,530	6,211	1,759	1,596	502	1,008	898	199	95	3,960	7,149	6,736	109.5	108.4	—619	670	—2,531	—2,222
Piedmont & Northern	August	128	483	....	494	491	40	48	4	30	32	8	29	83	212	220	42.9	44.8	282	141	93	92
	8 mos.	128	3,718	....	3,794	3,663	364	371	36	241	230	82	224	665	1,739	1,660	45.8	45.3	2,055	1,031	658	681
Pittsburgh & West Virginia	August	132	746	....	752	844	105	120	26	130	137	38	62	201	552	570	73.4	67.5	200	114	115	146
	8 mos.	132	6,009	....	6,039	5,567	830	864	202	1,089	1,000	298	525	1,626	4,485	4,111	74.3	73.8	1,554	797	867	855
Reading	August	1,304	10,144	543	11,431	9,771	1,546	1,585	195	2,223	1,937	428	169	4,450	8,875	7,936	77.6	81.2	2,557	959	1,342	1,199
	8 mos.	1,305	79,826	4,626	90,015	76,271	11,555	10,040	1,545	17,094	14,667	3,411	1,447	35,495	69,454	59,453	77.2	77.9	20,561	9,017	9,628	9,353
Richmond, Fredericksburg & Potomac	Aug.	118	1,360	545	2,171	2,037	231	264	22	327	310	67	24	728	1,451	1,439	66.8	70.7	720	393	245	182
	8 mos.	118	12,114	4,094	18,568	18,150	1,849	2,284	194	2,554	2,590	537	199	6,096	11,859	12,001	63.9	66.1	6,709	3,467	2,309	1,929

(More statistics on page 44)

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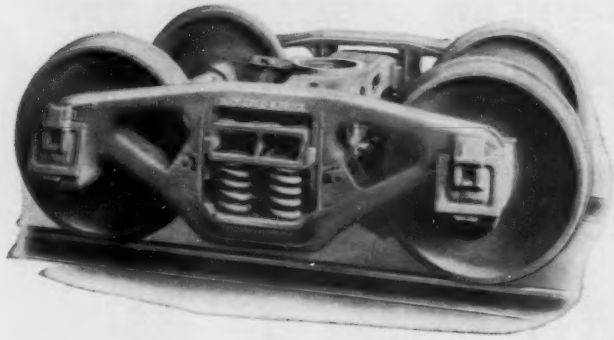

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REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1956	Total (inc. misc.) 1955	Operating Expenses: Maint. Way and Structures: Total 1956	Total 1955	Deprec. and Retire-ments	Maint. Equipment: Total 1956	Total 1955	Deprec. and Retire-ments	Traffic	Trans-portation	Tota 1956	Total 1955	Operating ratio 1956	Operating ratio 1955	Net from railway operation	Railway tax accruals	Net railway operating income 1956	Net railway operating income 1955
Rutland	August	391	394	....	426	438	92	95	9	49	42	16	29	162	368	344	86.4	78.6	58	28	13	36
	8 mos.	391	3,180	....	3,443	3,132	715	625	78	412	412	120	222	1,246	2,830	2,623	82.2	83.7	613	221	221	124
Sacramento Northern	August	347	171	....	183	247	91	58	5	14	13	—4	3	89	210	187	115.1	75.6	—28	17	—64	27
	8 mos.	347	1,207	1	1,282	1,612	636	459	37	120	116	35	18	567	1,453	1,255	113.3	77.9	—171	124	—412	102
St. Louis-San Francisco	August	4,610	9,990	430	11,171	10,170	1,675	1,522	189	1,684	1,796	566	388	4,273	8,626	8,028	77.2	78.9	2,545	1,230	1,243	1,107
	8 mos.	4,610	75,003	3,027	83,850	80,632	12,503	11,806	1,373	13,691	13,899	4,414	3,200	31,851	66,050	62,382	78.8	77.4	17,800	8,896	8,937	9,092
St. Louis, San Francisco & Texas	August	155	307	6	338	399	37	68	4	33	30	1	28	162	272	294	80.5	73.6	66	20	—13	17
	8 mos.	155	2,936	29	3,154	3,230	337	449	41	277	253	9	220	1,234	2,169	2,263	68.8	70.0	985	329	163	211
St. Louis Southwestern Lines	August	1,561	5,287	20	5,492	6,054	693	734	82	804	590	157	198	1,700	3,581	3,290	65.2	54.4	1,911	870	833	1,063
	8 mos	1,561	43,919	137	45,450	44,117	5,566	5,231	566	5,417	4,640	1,037	1,518	14,023	28,033	25,466	61.7	57.7	17,417	7,871	7,355	7,052
Savannah & Atlanta	August	144	316	1	331	322	47	53	2	55	46	19	13	88	214	202	64.5	62.8	118	38	75	56
	8 mos.	144	2,541	3	2,649	2,361	423	379	12	385	347	127	121	713	1,730	1,527	65.3	64.7	919	289	465	402
Seaboard Air Line	August	4,062	10,426	1,269	12,595	11,663	1,590	1,571	199	2,436	2,198	603	395	4,399	9,493	8,576	75.4	73.5	3,102	1,278	1,922	2,008
	8 mos.	4,062	91,660	9,639	109,897	101,881	15,324	15,360	1,571	20,304	18,398	4,736	3,153	36,488	80,369	73,765	73.1	72.4	29,528	11,787	16,081	16,027
Southern Railway	August	6,289	20,336	1,404	23,284	23,209	3,502	3,111	376	3,674	3,878	796	459	7,170	16,018	15,520	68.8	66.9	7,265	2,411	4,653	4,175
	8 mos.	6,289	160,649	10,049	183,565	183,024	25,341	22,899	2,461	32,687	30,551	6,492	3,562	56,968	127,351	119,391	69.4	65.2	56,214	23,843	30,066	29,840
Alabama Great Southern	August	326	1,339	81	1,504	1,779	253	247	30	270	328	60	39	432	1,099	1,209	73.1	68.0	404	167	238	296
	8 mos.	326	10,726	488	12,169	14,062	2,004	1,887	309	2,450	2,438	479	295	3,787	9,285	9,280	76.3	66.0	2,884	1,359	1,514	2,226
Cinn., New Orleans & Texas Pac.	August	337	2,914	195	3,353	3,797	601	551	58	587	582	137	80	928	2,397	2,359	71.5	62.1	956	467	602	817
	8 mos.	337	26,059	1,186	28,917	32,828	4,712	4,346	323	5,138	5,048	1,164	625	7,242	19,126	18,838	66.1	57.4	9,790	5,306	5,360	6,532
Georgia Southern & Florida	August	475	702	60	844	866	246	224	10	73	76	10	26	292	693	628	82.0	72.5	152	39	—40	10
	8 mos.	475	5,774	483	6,852	7,207	1,807	2,027	86	677	623	78	210	2,157	5,272	5,443	77.0	75.5	1,579	339	—44	—189
New Orleans & Northeastern	August	204	1,195	54	1,328	1,163	187	161	21	150	134	43	24	240	676	596	50.9	51.3	652	371	248	279
	8 mos.	204	8,236	340	9,175	8,834	1,325	1,325	169	1,251	1,095	342	181	1,866	5,150	4,841	56.1	54.8	4,025	2,501	1,530	1,564
Southern Pacific	August	8,103	41,680	3,473	47,951	50,317	5,986	6,391	496	10,564	10,161	2,044	864	19,460	39,212	39,444	81.8	78.4	8,738	3,692	3,515	4,950
	8 mos.	8,114	316,977	22,077	359,671	354,570	44,578	43,417	3,855	77,630	72,524	16,220	7,247	144,269	291,714	276,235	81.1	77.9	67,956	28,445	28,880	35,253
Texas & New Orleans	August	4,298	10,786	492	11,993	11,857	2,148	2,533	175	1,703	1,806	185	292	4,450	9,234	9,420	77.0	79.4	2,759	1,133	584	569
	8 mos.	4,310	84,641	3,444	93,533	90,551	17,131	16,462	1,425	13,576	12,347	1,491	2,344	33,832	71,912	66,723	76.9	73.7	21,621	7,863	5,212	5,983
Spokane International	August	150	355	....	367	354	55	59	2	33	21	10	6	82	193	181	52.4	51.3	175	70	71	67
	8 mos.	150	2,399	....	2,477	2,426	537	395	20	235	212	77	49	653	1,585	1,326	64.0	54.6	891	308	338	479
Spokane, Portland & Seattle	August	947	3,372	121	3,666	3,111	460	362	47	446	390	114	36	1,024	2,080	1,770	56.7	56.9	1,586	429	945	926
	8 mos.	947	20,819	711	22,851	21,423	3,208	3,002	409	3,474	3,063	880	260	7,602	15,431	14,087	67.5	65.8	7,419	2,197	4,208	4,070
Tennessee Central	August	286	443	1	453	441	78	81	7	70	73	22	17	132	323	316	71.3	71.8	130	25	59	57
	8 mos.	286	3,421	48	3,546	3,399	644	577	46	553	494	167	127	1,043	2,393	2,477	73.1	72.9	953	198	388	306
Texas & Pacific	August	1,831	5,238	451	6,295	6,666	1,140	1,098	117	1,215	1,107	255	199	2,411	5,327	4,945	84.6	74.2	968	305	308	692
	8 mos.	1,831	46,644	2,749	53,881	52,920	8,779	8,221	810	8,595	8,136	2,037	1,665	19,091	40,980	38,157	76.1	72.1	12,901	3,979	5,774	6,249
Texas Mexican	August	161	247	....	263	261	58	49	6	30	27	10	11	74	196	180	74.4	69.1	67	23	10	23
	8 mos.	161	1,989	....	2,163	2,084	418	378	45	249	232	79	85	563	1,473	1,368	68.1	65.7	690	277	171	208
Toledo, Peoria & Western	August	239	648	....	658	604	100	109	6	59	55	12	49	151	399	397	60.6	65.7	259	51	152	60
	8 mos.	239	5,130	1	5,202	4,647	797	701	50	400	449	93	416	1,237	3,148	2,976	60.5	64.0	2,054	834	739	494
Union Pacific	August	9,797	40,803	3,264	47,360	49,310	5,200	5,942	599	7,034	8,000	1,701	939	15,531	30,950	33,022	65.4	67.0	16,410	8,384	5,286	5,902
	8 mos.	9,802	289,199	20,115	333,166	330,193	45,617	45,479	4,028	60,975	60,122	13,582	8,996	113,757	246,995	242,185	74.1	73.3	86,171	45,427	26,656	28,475
Virginian	August	611	5,150	....	5,392	4,620	575	504	60	710	776	206	52	1,005	2,439	2,170	45.2	47.0	2,953	1,588	1,503	1,365
	8 mos.	611	35,071	1	36,689	28,212	3,880	3,557	521	5,139	5,635	1,612	421	7,226	17,486	15,945	47.7	56.5	19,203	10,528	10,205	7,144
Wabash	August	2,393	8,308	480	9,559	10,074	1,075	1,147	101	1,358	1,353	405	323	4,297	7,499	7,392	78.5	73.4	2,060	701	728	1,062
	8 mos.	2,393	68,138	3,297	77,734	76,275	8,865	9,221	985	10,912	10,511	3,063	2,731	33,542	59,539	56,931	76.6	74.6	18,196	6,387	6,590	7,910
Ann Arbor	August	294	886	....	927	822	91	103	7	158	157	32	31	371	675	638	72.8	77.5	252	129	105	75
	8 mos.	294	6,321	3	6,464	6,134	730	768	56	1,151	1,090	236	246	2,800	5,108	4,871	79.0	79.4	1,356	687	467	518
Western Maryland	August	846	4,190	5	4,458	4,356	643	575	52	710	654	225	109	1,310	3,009	2,787	67.5	64.0	1,450	751	958	992
	8 mos.	847	31,703	37	33,871	30,252	4,729	4,302	366	5,951	5,000	1,770	890	10,615	24,152	20,919	71.3	69.2	9,718	4,897	6,682	6,249
Western Pacific	August	1,192	4,224	235	4,577	4,731	1,001	887	128	644	660	201	227	1,589	3,737	3,544	81.6	74.9	840	257	445	571
	8 mos.	1,192	32,634	1,656	35,238	34,573	6,892	6,450	712	5,079	5,134	1,588	1,698	11,913	27,749	25,931	78.7	75.0	7,489	2,424	4,361	4,414
Wisconsin Central	August	1,042	2,781	59	3,017	2,901	457	390	43	439	410	93	78	1,106	2,211	2,029	73.3	70.0	806	180	470	545
	8 mos.	1,042	20,376	327	21,907	20,071	3,507	3,104	332	3,373	3,060	728	643	8,620	17,149	15,373	78.3	76.6	4,758	1,348	2,101	2,367

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1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Robert G. Lewis, 30 Church St., New York 7, N. Y.

Editor, James G. Lyne, 30 Church St., New York 7, N. Y.

Managing editor, C. B. Tavenner, 30 Church St., New York 7, N. Y.

Businesss manager, Robert G. Lewis, 30 Church St., New York 7, N. Y.

2. The owners are: Simmons-Boardman Publishing Corp., 30 Church St., New York 7, N. Y. Stockholders of one percent or more, James G. and Louise Lyne, 30 Church St., New York 7, N. Y., Arthur J. McGinnis, 30 Church St., New York 7, N. Y., Frederick A. and Artimese B. Clark, 30 Church St., New York 7, N. Y., Samuel O. and Carrie E. Dunn, 79 West Monroe St., Chicago 3, Ill., Joseph or Katherine Sanders, 2909 Maple Ave., Dallas 4, Texas, John R. Thompson and Kathe Thompson, 79 West Monroe St., Chicago 3, Ill., Mae E. Howson, 6922 Paxton Ave., Chicago, Ill., Marion M. Crampton and Ella S. Mills, 618 Highland Ave., Westfield, N. J., Ruth Wheaton Johnson, 1615 Ravenna Blvd., Seattle 5, Wash., William E. Russell as Trustee L/W/T of Ida R. Simmons F/B/O, Mrs. E. S. Fenton, % Russell and Russell, 41 East 42nd St., New York 17, N. Y., J. Streicher & Co., 2 Rector St., New York, N. Y., Partners of J. Streicher & Co are: Joseph Streicher, Jack L. Streicher, Ethel Streicher, Judson Streicher all of 2 Rector St., New York, N. Y., Joseph V. McManus, 39 Broadway, New York, N. Y.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not apear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.) 14,551.

ROBERT G. LEWIS,
Publisher.

Sworn to and subscribed before me this 1st day of October, 1956.

EDMUND J. PUYDAK

[SEAL] (My commission expires March 30, 1958)

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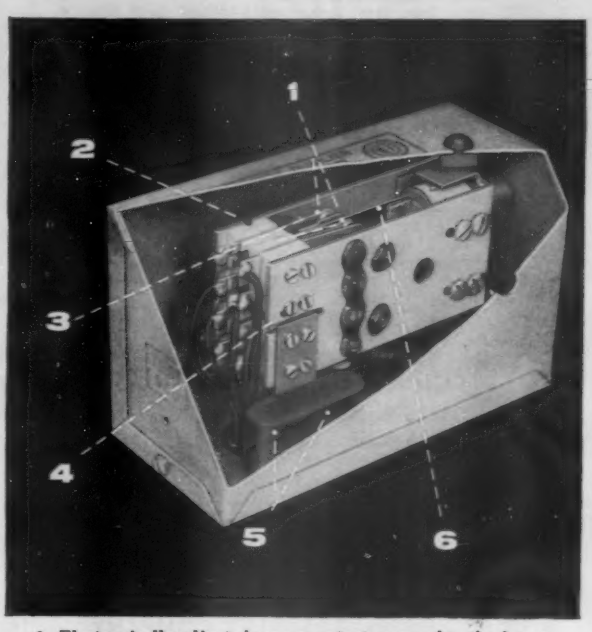

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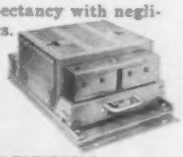

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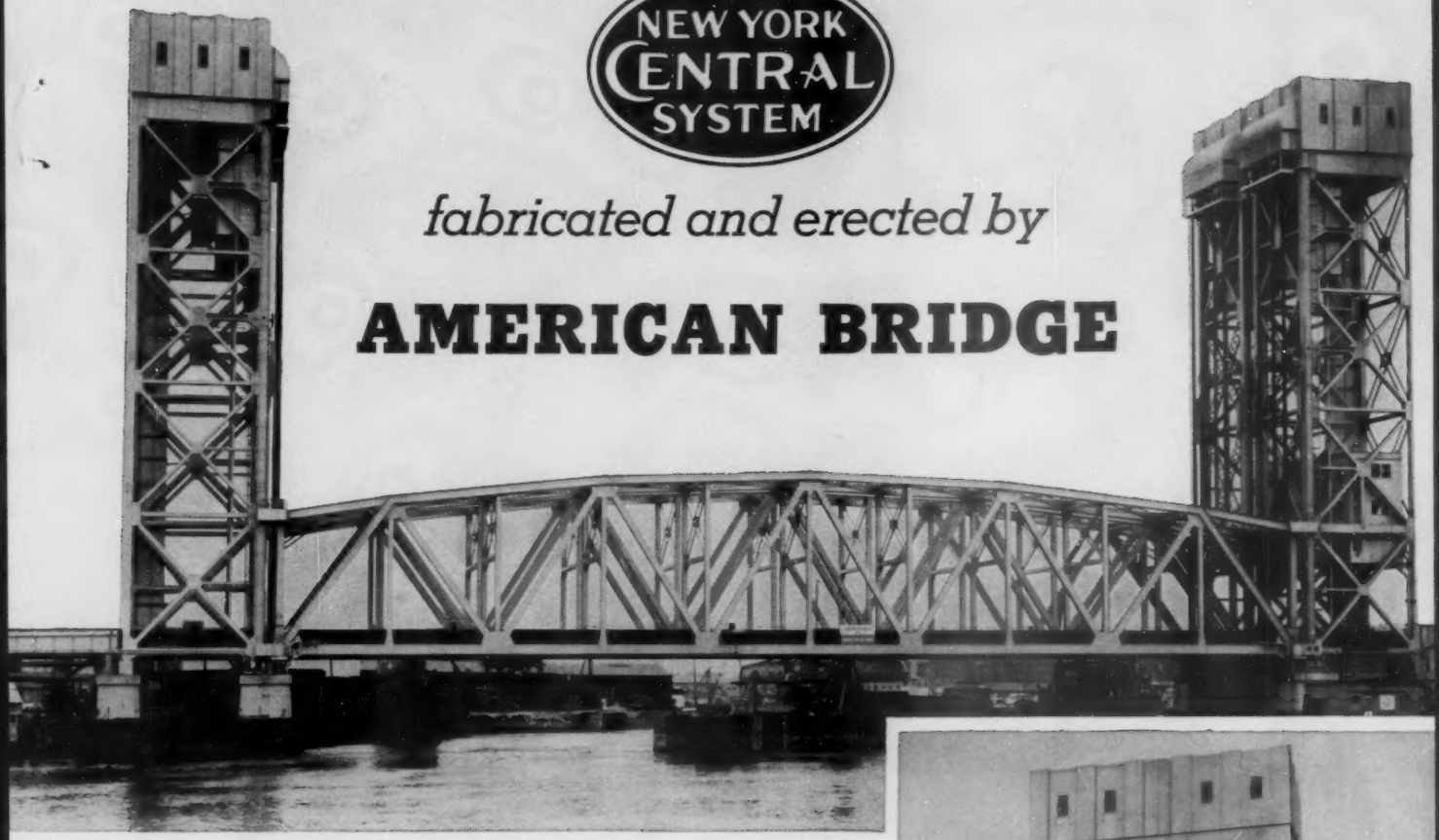

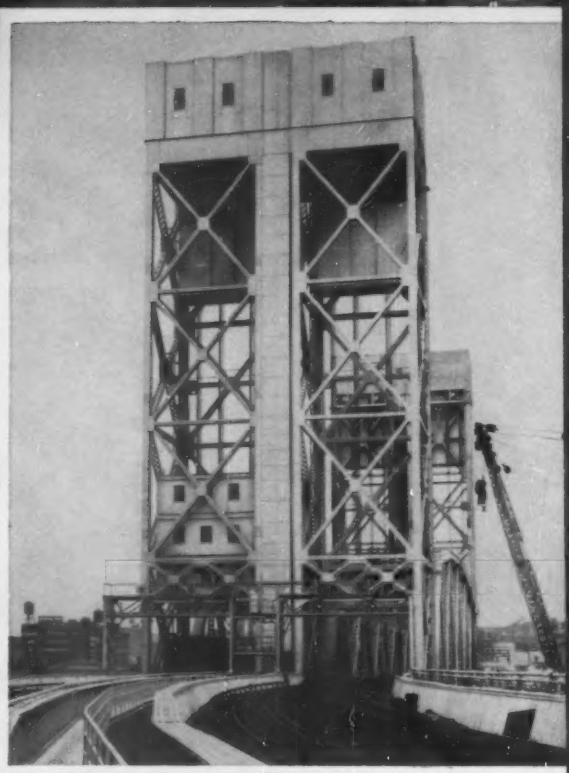

1,772-ft. structure features parallel double-track vertical lift spans —

Replacing an old thru truss swing bridge built about 1895, New York Central's new Harlem River Bridge is as modern as you'll find anywhere.

1,772 ft. between abutments, it is a four-track, 28-span structure composed of: two duplicate, parallel, double-track Thru Warren Truss Vertical Lift Spans, 340 ft. long; four duplicate, double-track Tower Spans, 40′ long x 33′ wide x 200′ high—two for each lift span; fifteen 4-track Thru Plate Girder Spans, 38′ - 9″ to 84′ - 2″ long, for South Approach; fourteen double-track Deck Plate Girder Spans—six 61′, and eight 54′—for seven-span North Approach; three 4-track Beam Spans—11′, 19′, and 24′—forming the decks of three intermediate piers in North Approach.

The lift spans are 33′ wide and 11′ apart, center-to-center of inside trusses. Trusses are 40′ to 55′ deep. Each lift span contains 1,280 tons of structural steel and has a lift of 110′, from 25′ above water in lowered position to 135′ above water when raised. Each lift span is raised by means of 64 wire ropes riding on eight main counter-weight sheaves 15′ - 6″ in diameter.

American Bridge fabricated and erected the 13,670 tons of structural steel for this modern bridge and dismantled the existing structure. The New York Central Railroad designed the lift spans and approaches. Hardesty & Hanover designed the Tower Spans and Lifting Machinery.

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UNITED STATES STEEL

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YOU put freight car journals on roller bearings for two reasons: 1) to end the hot box problem, and 2) to cut operating and maintenance costs to rock bottom. Only Timken® tapered roller bearings do both! The taper makes the difference. Here's why:

(1) *Positive roller alignment.* The taper in Timken bearings holds roller ends snug against the rib, where wide area contact keeps rollers properly aligned. Rollers can't skew. Full line contact is maintained.

(2) *No lateral movement within the bearing.* Because of the taper, there's no lateral movement to pump lubricant through the seal. Expensive lubricant is saved. And it can't leak onto the rails to cause costly wheel slip on diesel locomotives and freight cars. Because Timken bearings roll the load—never slide it—there's no scuffing of rollers and races. Result: longer bearing life.

Timken bearings cut operating and maintenance costs to a bare minimum—reduce terminal bearing inspection time 90%, lubricant cost 95%. What's more, the new Timken heavy-duty type AP (All-Purpose) journal bearing assembly will go three years without adding lubricant. And it costs less to install, costs less to use.

Unlike costly "crutch" devices that merely attempt to improve friction bearing performance, Timken bearings eliminate the cause of hot boxes. The big switch to roller bearings is on. And 7 out of 10 roller bearing freight cars roll on *Timken* bearings. It's the taper!

Get all the advantages when you switch to roller bearings to end the hot box problem. Cut operating and maintenance costs to the minimum. Specify Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

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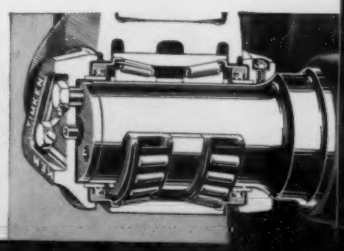
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